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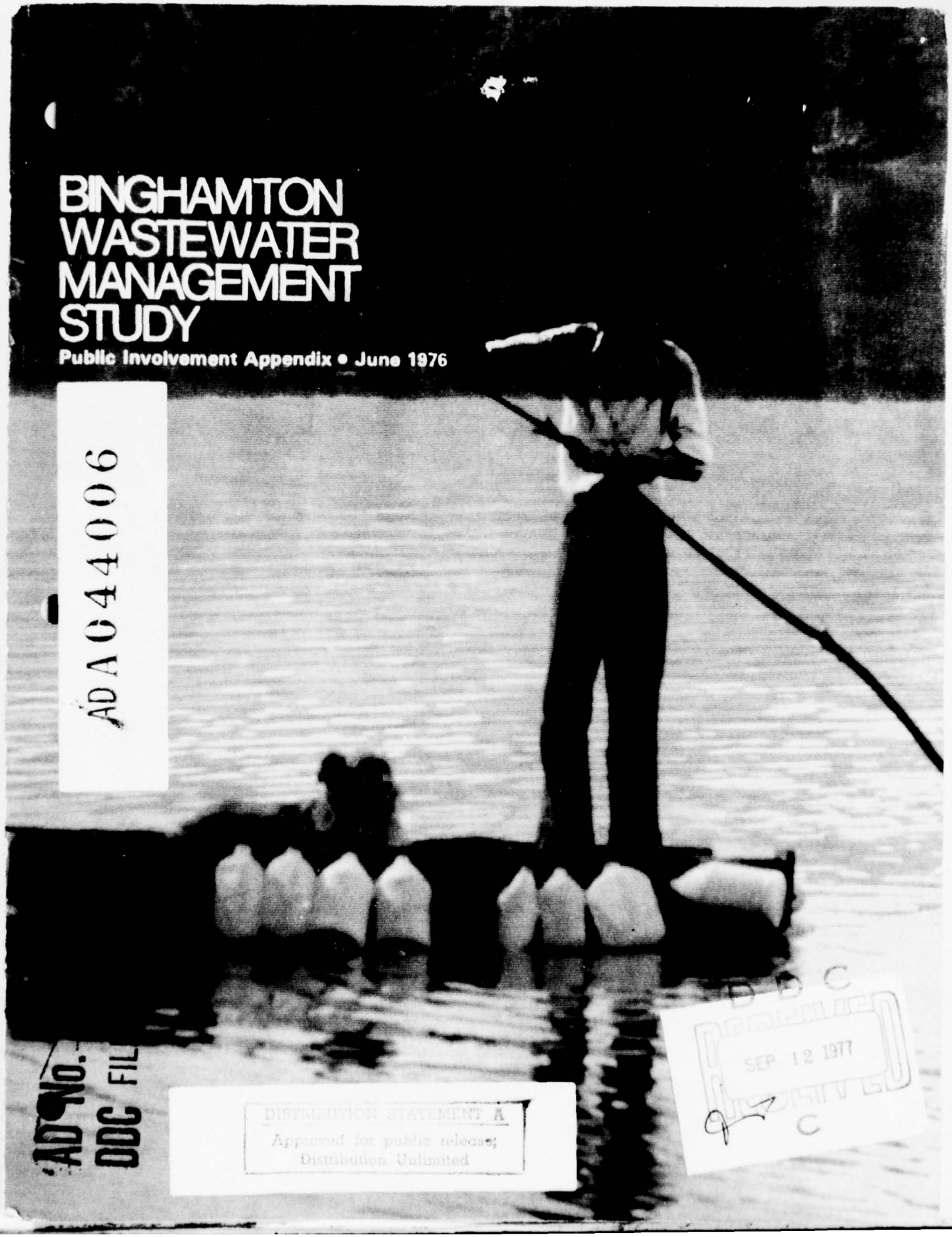


BINGHAMTON WASTEWATER MANAGEMENT STUDY

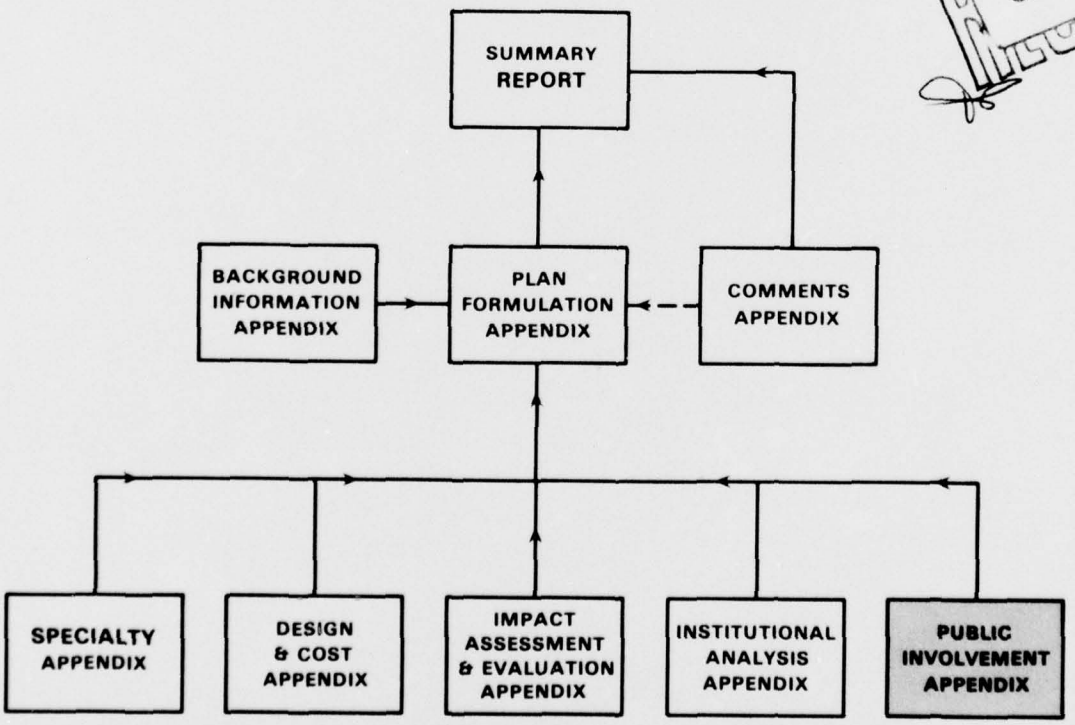
Public Involvement Appendix • June 1976

"The Raft of Summer"
Courtesy of Paul Smith, Binghamton, New York

Someone once said a picture is worth a thousand words, and the cover photograph summarizes the study in a simple but graphic manner. Today, the modern Huck Finn can enjoy many scenic and recreational opportunities associated with a Susquehanna River relatively free of pollutants. But tomorrow when the boy is grown, will the river still offer clean water for his children's enjoyment? This study suggests some ways to keep the Susquehanna clean and to ensure that future generations in Broome and Tioga Counties can enjoy "The Raft of Summer."

The report for the Binghamton Wastewater Management Study consists of nine volumes. The Summary Report, Background Information Appendix, Plan Formulation Appendix, and Comments Appendix consistute the primary study documents. The five remaining reports support the Plan Formulation Appendix. The relationship of the Public Involvement Appendix to the other documents is indicated in the diagram below.

The Public Involvement Appendix discusses how the study was coordinated with government agencies and the general public; who participated in the study; and the sequence of public participation, including public meetings and newsletters. The Appendix describes materials distributed to study participants and the general public. There is also an evaluation of the public involvement program.



BINGHAMTON WASTEWATER MANAGEMENT STUDY

PUBLIC INVOLVEMENT Appendix

JUNE 1976

Prepared by the

BALTIMORE DISTRICT, CORPS OF ENGINEERS

DEPARTMENT OF THE ARMY

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BINGHAMTON WASTEWATER MANAGEMENT STUDY

PUBLIC INVOLVEMENT APPENDIX

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CHAPTER I

INTRODUCTION

The public involvement program was an essential part of the Binghamton Wastewater Management Study. This appendix describes the public involvement program as strategies were delineated, alternatives formulated, and plans refined.

The public was defined as any person or agency outside the Corps of Engineers. Thus, coordination with other Federal agencies, with State and local governments and elected officials, and with the general public was considered essential in the Binghamton Wastewater Management Study.

The overall purpose of the public involvement program was:

1. To promote full public understanding of the manner and means by which water resource problems and needs were investigated and solutions proposed;

2. To keep the public fully informed regarding the status and progress of the Study and the results and implications of planning activities; and

3. To solicit from the public their opinions and perception of problems, issues, concerns, and needs, their preferences regarding water resource use and plan development, and any other information and assistance relevant to the planning process.

Chapter II presents the public involvement structure - the Interagency Study Management Group (ISMG), the Citizens Advisory Committee (CAC), and the Technical Advisory Committee (TAC) - their purpose and why they were established. Chapter III identifies the various Federal, state, and local agencies involved in the Study and some of their water resource programs. Chapter IV presents the sequence of events that occurred during the Study as well as documents the more important decisions that were made at public

meetings, and the ISMG, CAC, and TAC meetings. Written material distributed to study participants at public meetings and during the course of the study is the subject of Chapter V. Chapter VI analyzes the public involvement program as perceived by the Corps of Engineers. The final chapter discusses and evaluates a methodology for a more effective public participation program.

CHAPTER II

MANAGEMENT STRUCTURE FOR THE STUDY

At the outset of the Study, it was realized that the Corps of Engineers would be involved in wastewater planning in the Southern Tier East Region for only a short period of time - the duration of the Study. It also seemed apparent that the Study would be greatly strengthened if other Federal, State, and local agencies could participate in the planning venture. Consequently, a series of meetings were held early in the Study to outline communication channels and develop a management structure to coordinate the efforts of the Study.

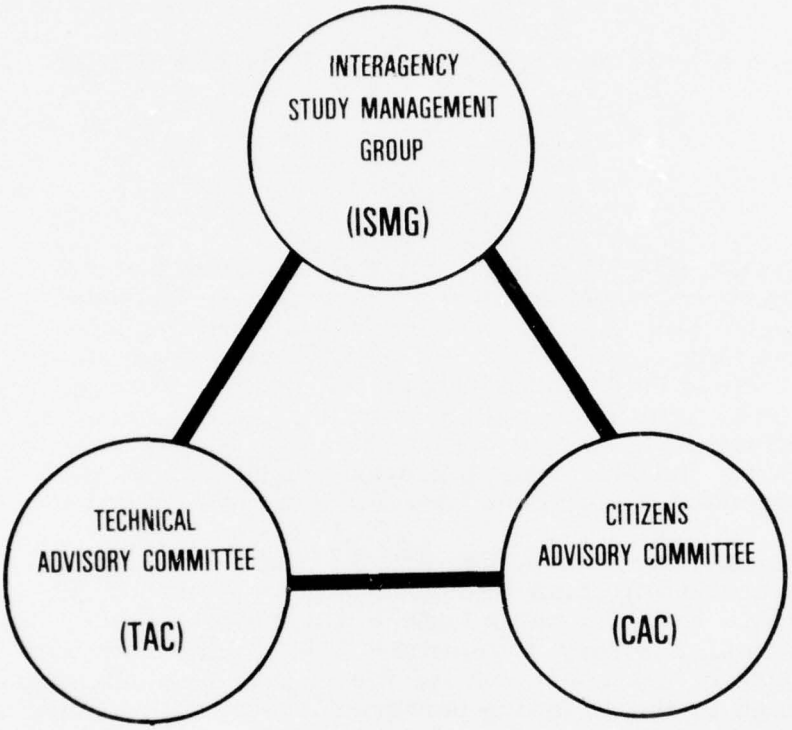
The management structure for the Study is shown in Figure II-1, consisting of an Interagency Study Management Group (ISMG), a Citizens Advisory Committee (CAC), and a Technical Advisory Committee (TAC). The purpose and function of each element of the management structure is outlined in the following paragraphs along with a discussion of the planning process used in this Study.

INTERAGENCY STUDY MANAGEMENT GROUP

The Interagency Study Management Group (ISMG) had its first meeting in January 1974, when it was agreed that the Study effort should include representatives of Federal, State, and local agencies involved in wastewater planning. It was also decided that the following agencies should be principal participants in the ISMG: Southern Tier East Regional Planning Board (STERPB), New York State Department of Environmental Conservation (NYSDEC), U.S. Environmental Protection Agency (EPA), and U.S. Army Corps of Engineers, Baltimore District. The Susquehanna River Basin Commission subsequently joined the ISMG as a fully participating member. Table II-1 indicates ISMG members.

FIGURE II-1

MANAGEMENT STRUCTURE



The purpose of the ISMG was to provide overall guidance and direction for the Study effort. The structure provided a means for each participating agency to have a vital role in the outcome of the Study, and ensured that the study would conform to guidelines, regulations, and policies of each of the agencies.

A total of 8 ISMG meetings were held during the course of the study. Included in Chapter IV are the most important considerations and decisions that occurred at these meetings.

TABLE II-1

ISMG MEMBERS

Charles N. Durfor
Chief, Water Programs Branch
U. S. Environmental
Protection Agency, Region II
New York

Michael J. O'Toole, Jr.
Chief, Water Quality Planning
New York State Department
of Environmental Conservation
Albany, New York

Joseph Missavage
Executive Director
Southern Tier East Regional
Planning Board
Binghamton, New York

Robert J. Bielo
Executive Director
Susquehanna River Basin
Commission
Mechanicsburg, Pennsylvania

James E. Crews
Chief, Urban Studies Branch
Corps of Engineers
Baltimore District

CITIZENS ADVISORY COMMITTEE

At the request of the Corps of Engineers, the STERPB prepared a list of about 20 individual citizens who were known to be interested in water resources management planning. These people were then invited to participate on the Citizens Advisory Committee which held its first meeting on 5 March 1974. At the first CAC meeting and again at the first public meeting on 19 March 1974, it was suggested the Committee be more representative and the membership was expanded. A few more citizens were added as the study progressed. The list totaled 45 individuals toward the end of the study representing environmental, industrial, academic, civic, and governmental interests, as indicated in Table II-2. A total of 15 CAC meetings were held during the course of the study.

TABLE II-2

CITIZENS ADVISORY COMMITTEE MEMBERSHIP

Richard Andrus
Professor of Biology
SUNY, Binghamton

Loring Bixler
Conservationist
Vestal

Robert N. Burger
Mayor of Village of Owego
Owego

Dr. Donald Coates
Professor of Geology
SUNY, Vestal

Charles Costello
Superintendent of Water
City of Binghamton
Binghamton

Irwin DuBois
Diary Farmer
Endicott

Will Englehart
Supervisor
Town of Owego
Owego

Ed Frankowski
President
Broome County Federation
of Sportsmen
Endicott

Margaret Johnston
Binghamton

Dr. Leahy
Veterinarian
Whitney Point

Nancy Ayers
Executive Assistant
Standing Committee on
Consumer Protection
State of New York
Albany

Robert Breed
Dairy Farmer
Vestal

Dr. Joseph Butler
Professor of Geography
SUNY, Endicott

Harold Christian
Office of Local Government
State of New York
Binghamton

Carol Dieffenderfer
Owego

Dolores Elliott
Archeologist
Johnson City

James Franklin
Owego Planning Department
Whitney Point

Doug Graves
Tioga Center

Ed Hubbard
Tioga County Board of
Supervisors
Owego

Robert Kropp
Supervisor
Town of Union

TABLE II-2 (Continued)

Dr. Bruce McDuffie
Professor of Chemistry
SUNY, Binghamton

Harriet Marsi
Broome County Naturalist Club
Binghamton

Eugene Martiny
Binghamton-Johnson City Sewage Treatment Plant
Binghamton

Penny O'Brien
League of Women Voters
Endwell

Francis Orlando
Principal
Elementary School
Owego

Earle Ridley
Chairman
Broome County Legislature
Binghamton

Michael Savich
Mayor
Village of Johnson City
Johnson City

Joyce Smith
Fine Arts Management
Binghamton

D. W. Stuempfle
Environmental Engineer
IBM
Owego

Donald Wager, Chairman
Professor of Biology
Broome Community College
Binghamton

Dick Marko
Planning Director
Owego

Robert Martin
Businessman, Broome County Chamber of Commerce
Vestal

Joe Munk
Supervisor
Town of Vestal
Vestal

Barbara Oldwine
Social Services
Binghamton

Margaret Peet
Secretary
Binghamton

Richard Roush
Engineer
Apalachin

Robert Scudder
GAF
Binghamton

Donna Sibal
Graduate Student, Geography
SUNY, Binghamton

Jack Sperling
Off-Campus College
SUNY, Binghamton

Jade VanderVelde
Homemaker
Binghamton

Helen Waring
Binghamton

TABLE II-2 (Continued)

James Waring Chemist, GAF Binghamton	Al Wicks Dairy Farmer Port Crane
Ralph Windsor Dairy Farmer Harpursville	Rolf Wittich President Tioga County Chamber of Commerce Owego

The purpose of the CAC was to ensure that local views and objectives were incorporated into the planning process. The CAC provided a channel of communication whereby concerned citizens had the opportunity to make their views known and to obtain information relative to the Study. The CAC reflected opinions of groups within the Study Area and made suggestions for Study direction. The Committee also assisted the ISMG in determining the adequacy of alternatives under consideration and shared direction and sponsorship for the public involvement program.

TECHNICAL ADVISORY COMMITTEE

The Technical Advisory Committee (TAC) was composed of staff members from each of the ISMG agencies as well as representatives from various local agencies such as the Broome County Health Department and the City of Binghamton. Table II-3 identifies the TAC membership.

The purpose of the TAC was to review Study progress to ensure that solutions conformed to Federal, State, and local technical criteria for wastewater management. In that capacity, the TAC helped to screen alternatives and develop plans. The TAC also facilitated technical information exchange among Study participants. A total of 6 TAC meetings were conducted.

TABLE II-3

TECHNICAL ADVISORY COMMITTEE MEMBERSHIP

Brian Kessler
City Engineer
City of Binghamton

Roland Austin
Broome County Health Department
Broome County

Sandra McCullough
Southern Tier East Regional
Planning Board
Binghamton

Joseph Ritz
New York State Department
of Environmental Conservation
Albany

Charles Takita
Susquehanna River Basin
Commission
Mechanicsburg

John Witkowski and Daniel Kraft
U.S. Environmental Protection
Agency
New York

J. William Haines
Corps of Engineers
Baltimore

PLANNING PROCESS

The planning process for the Binghamton Wastewater Management Study followed the Corps of Engineers' guidelines established to implement the Water Resources Council's Principles and Standards for Planning Water and Related Land Resources, 10 September 1973. The Principles and Standards were established to provide the basis for Federal participation in the formulation, evaluation, and review of Federal water and related land resource programs and projects. The guidelines created specific objectives for planning of water resource activities, discussed how beneficial and adverse effects are to be considered, developed general evaluation standards, and outlined the plan formulation process.

The planning process used in this Study encompassed three stages, each stage having four iterative tasks. The process is shown diagramatically in Figure II-2 and is discussed in detail in the Plan Formulation Appendix. In Stage I, emphasis was placed on preparing a Plan of Study outlining a course of action to solve problems that were identified.

Planning Process

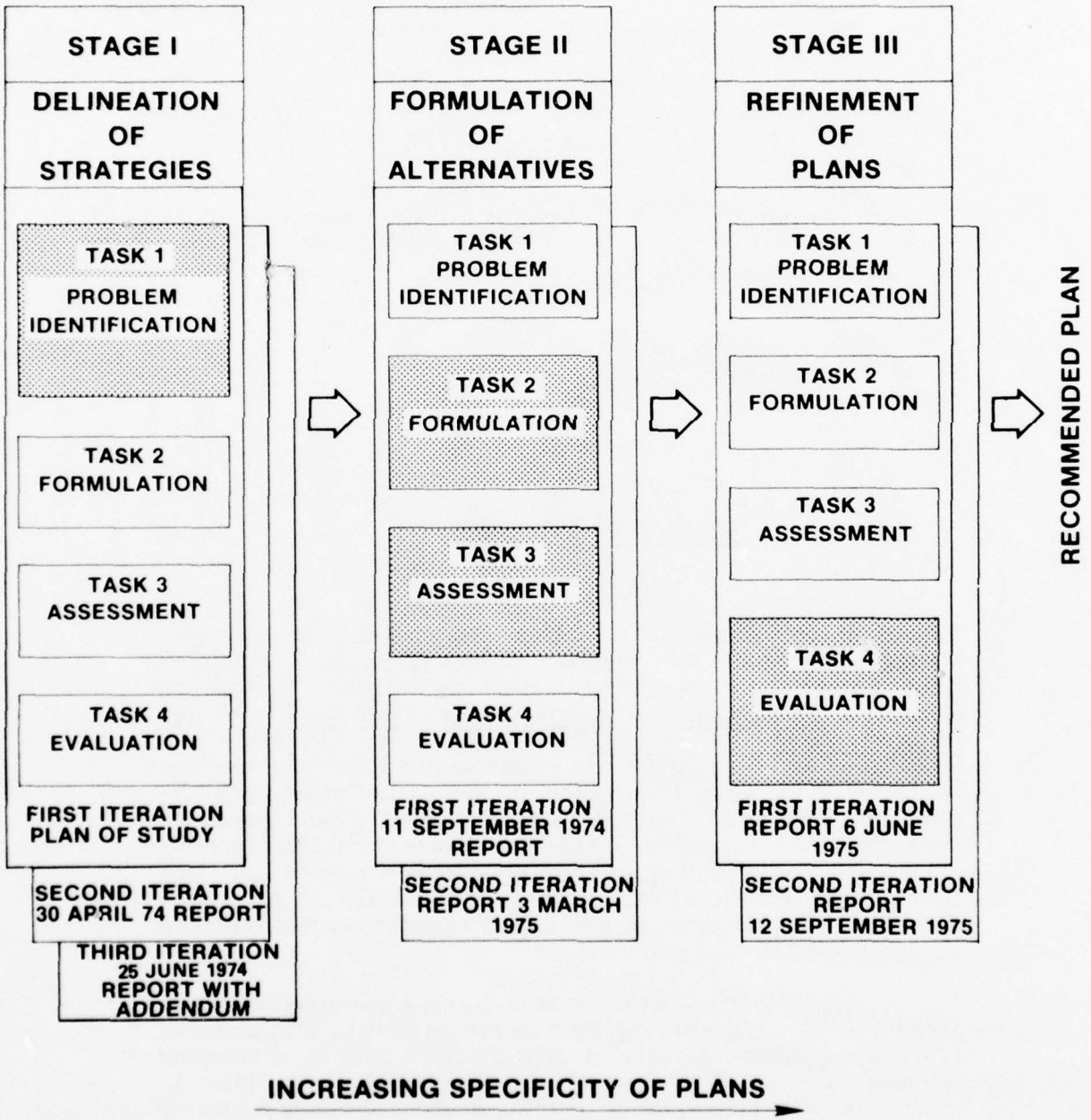


Figure II-2

In Stage II, primary attention was given to formulation of alternatives along with an assessment of impacts. And, in Stage III, a detailed refinement and evaluation of a select number of plans was conducted with the ultimate objective being the recommendation of a single "best" plan.

From the hundreds of conceptual components outlined in Stage I, about 40 alternatives were initially considered in Stage II. Some alternatives examined varying levels of regionalization (numbers of treatment plants). Other alternatives looked at different levels of treatment (secondary, nitrification, advanced waste treatment) as well as various treatment processes (biological, physical/chemical, land application). Flow reduction measures, both structural and non-structural, comprised still other alternatives. Stormwater and sludge management alternatives were also investigated.

From the delineation of strategies in Stage I to the formulation of alternatives in Stage II to the refinement of plans in Stage III, the ISMG, CAC, and TAC interacted to provide guidance and direction for the Study effort.

After a short description of the participants in Chapter III, the decision-making process will be characterized in Chapter IV.

CHAPTER III

PARTICIPANTS

The general public and various levels of government have been involved in the Study since its inception in January 1974. This chapter describes the major participants in the Study, as well as describes some of the more important water resource programs of various local, State, and Federal government agencies.

CITIZENS ADVISORY COMMITTEE

As explained in Chapter II, a Citizens Advisory Committee (CAC) was established early in the Study and was composed of environmentalists, homemakers, professors, local government officials, and engineers. Numerous meetings were held where the Committee reviewed reports prepared by the Corps and the Consultant to ensure that local needs and objectives were incorporated into the planning process. The Committee suggested directions for study effort and were instrumental in assisting the administration of the public involvement program.

LOCAL GOVERNMENT

Local government was deeply involved in the planning process. The City of Binghamton, the Broome County Health Department (BCHD), and the Southern Tier East Regional Planning Board (STERPB) were the major local agencies

that participated directly in the Study. Representatives from other local governments were more active through the Citizens Advisory Committee.

CITY OF BINGHAMTON

Municipal services are provided to the citizens of Binghamton by various City departments. The City cooperates with the Village of Johnson City in treating wastewater at a Joint Sewage Treatment Plant that handles wastewater for the two communities. The City Engineer for the City of Binghamton was very active during the Study and made substantial contributions toward Study progress.

During the course of the Study, the City of Binghamton conducted an analysis of infiltration/inflow problems. The analysis was conducted to determine if there were serious problems of infiltration/inflow and if there were, what would be the best method of treating this excessive flow. The results of that study have been incorporated into the wastewater management plans for the Bicounty Area. The Village of Johnson City began a similar infiltration/inflow study within its corporate boundaries as the Binghamton Wastewater Management Study was nearing completion.

BROOME COUNTY HEALTH DEPARTMENT

The Broome County Health Department (BCHD) is responsible for health standards, including water quality, throughout the County. Annual inspections of municipal and industrial water supply systems for bacteriological and chemical quality are the responsibility of the Department.

In addition, stream sampling and surveillance of water quality are also a part of their program, as well as soil percolation tests of individual sewage systems for homes and buildings. The Department also surveys river water quality with respect to industrial discharges of wastewater.

SOUTHERN TIER EAST REGIONAL PLANNING BOARD

Broome and Tioga Counties cooperate in joint planning efforts through the Southern Tier East Regional Planning Board (STERPB). Certified by the Department of Housing and Urban Development as the areawide planning organization, the Board is responsible for carrying out long-range comprehensive planning programs in the Bicounty Area. The Board has continued to fulfill regional planning requirements mandated in the Demonstration Cities and Metropolitan Act of 1966 and the Intergovernmental Cooperation Act of 1968. The STERPB has recently been expanded to include the counties of Chenango, Cortland, Delaware, Otsego, Schoharie, and Tompkins, and the name has been changed to the Southern Tier East Planning Development Board (STERPDB).

Responsibilities include transportation planning, assisting communities with their planning efforts, environmental management, and land use surveys. Enhancing the environment along the rivers through a system of parks and conservation areas by a Riverbanks Improvement Program has high priority with the Board. The Board also helps to manage flood plains by assisting local communities to become eligible for the National Flood Insurance Program.

STATE GOVERNMENT

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

The New York State Department of Environmental Conservation (NYSDEC) has programs for river basin protection and management, for monitoring and classifying the state's waters, and for controlling water pollution. In the Binghamton area, NYSDEC has joined with local and Federal interests in constructing four new secondary treatment plants during the past several years. These efforts have resulted in continued improvement in water quality in the Susquehanna River since the late 1960's. Two bond issues have committed NYSDEC to extensive water pollution control activities. The 1965 Pure Waters Bond Act authorized

1 billion dollars to enhance water quality; even with this effort, it became apparent that further work would be required. Subsequently, the Environmental Quality Bond Act of 1972 was passed and an additional $650 million was designated for water quality programs.

FEDERAL GOVERNMENT

U.S. ENVIRONMENTAL PROTECTION AGENCY

The U.S. Environmental Protection Agency (EPA) is an independent Federal government agency charged with the responsibility of protecting and enhancing the environment. The agency endeavors to abate and control pollution systematically by research, monitoring, standard setting, and enforcement activities.

The Federal Water Pollution Control Act Amendments of 1972 gives EPA the Federal responsibility for managing water quality in the United States. Seventy-five percent of the cost of planning, designing, and constructing wastewater treatment facilities is available through EPA's grant programs. State and local agencies which request funding under the 75 percent Federal-25 percent non-Federal cost-sharing arrangements for wastewater treatment must satisfy EPA requirements.

The EPA contributed the Federal share for the four new secondary treatment plants constructed in the Bicounty Area during the past several years. For the Binghamton study, EPA made certain that activities were conducted in accordance with Federal requirements for areawide wastewater treatment planning so that subsequent grants for design and construction could proceed smoothly.

SUSQUEHANNA RIVER BASIN COMMISSION

The Susquehanna River Basin Commission was created as a Federal-Interstate Compact organization consisting of the U.S. Government and the States of Maryland and New York and the Commonwealth of Pennsylvania. Under the terms of the compact, the Susquehanna River Basin Commission is responsible for management of water and related land resources within its jurisdiction. These responsibilities include development of ground and surface water supplies for municipal, industrial, and agricultural uses, abatement of stream pollution, flood damage reduction, promotion of forestry, soil conservation, and watershed projects, propagation of fish and wildlife, development of water-related recreational facilities, and assessing hydroelectric power potentials. The Commission reviews water resource programs and plans by various agencies for consistency within the entire Basin.

CORPS OF ENGINEERS

The U.S. Army Corps of Engineers is a Federal government agency within the Department of Defense. The Civil Works Program of the Department of the Army is conducted by the Corps of Engineers. The Corps has major Federal water resource responsibilities including planning and development for flood control, water supply, water quality, navigation, hydroelectric power, and recreation.

In 1970, the Congress authorized the Corps to turn its extensive experience in water resource planning toward metropolitan areas with emphasis on wastewater management. A number of pilot studies were performed which gave theCorps experience in the wastewater management field. The Congress directed the Corps of Engineers, through the Baltimore District, to conduct the Binghamton Wastewater Management Study in cooperation with Federal, state, and local government agencies and interested organizations and individuals.

The Corps of Engineers provided 75 percent of the total planning effort and had major responsibility for collecting data, formulating wastewater management alternatives, and

writing the final report. To assist their effort, the Corps contracted with the consulting firm of Lawler, Matusky and Skelly Engineers of Tappan, New York, (formerly Quirk, Lawler, and Matusky Engineers) for technical aspects of the work.

EFFORT SHARING

Effort sharing is the monetary and physical contributions made by Federal, state, and local agencies toward Study accomplishment. Effort sharing guidelines for wastewater studies require that 25 percent of the effort be contributed by non-Federal interests. This requirement makes the program comparable to the U.S. Environmental Protection Agency grant programs.

The 25 percent non-Federal share may be in the form of services, work effort, or cash contributions. If the share is provided in services, the contributions must represent additional new effort specifically required in the conduct of the study. Other Federal funds may not be used to make up any part of the non-Federal participation. Revenue shared funds are exempted from this requirement. The various kinds of effort sharing activities for the Binghamton Wastewater Management Study are described in the paragraphs below.

Two general kinds of effort sharing activities were identified at the beginning of the Study: those associated with time and effort of State and local government officials, and those special studies that directly complemented the Binghamton Wastewater Management Study. State and local effort was required during the many Interagency Study Management Group, Citizens Advisory Committee, and Technical Advisory Committee meetings held throughout the Study. Staff from NYSDEC, STERPB, BCHD, the City of Binghamton, and various other municipalities also attended these meetings. In addition, there were public meetings that required preparation, travel, and attendance. Facilities for the meetings were also required and were provided by local government as a part of the effort sharing program. A number of reports were prepared for the Study. Some of these were extensive two volume works. Each had to be reviewed by State and local agencies.

Two important studies complemented the Binghamton Wastewater Management Study. The first was an analysis of infiltration/inflow for the City of Binghamton performed to determine a cost-effective solution for reducing excess flow to the Binghamton-Johnson City STP. Development in the Chenango Valley also required planning for wastewater management. The second study examined various alternatives for wastewater management in the Valley. Other activities associated with effort sharing included assistance in field reconnaissance in the Study Area, development and interpretation of information about the existing wastewater management systems, and projection of future growth trends and patterns.

In summary, the effort-sharing program helped to make the Study an endeavor responsive to State and local desires as well as Federal regulations.

CHAPTER IV

SEQUENCE OF PUBLIC PARTICIPATION

The public involvement process for the Binghamton Wastewater Management Study involved numerous meetings of the Interagency Study Management Group (ISMG), the Citizens Advisory Committee (CAC), and the Technical Advisory Committee (TAC). The process also involved the general public through media coverage, newsletters, workshops, and public meetings. This chapter discusses how the public involvement program enhanced decision-making in each of the three stages of the planning process.

A chronology of events in the public involvement program is shown in Figure IV-1. The sequence of the ISMG, CAC, TAC, and public meetings as well as the publication of newsletters is also displayed.

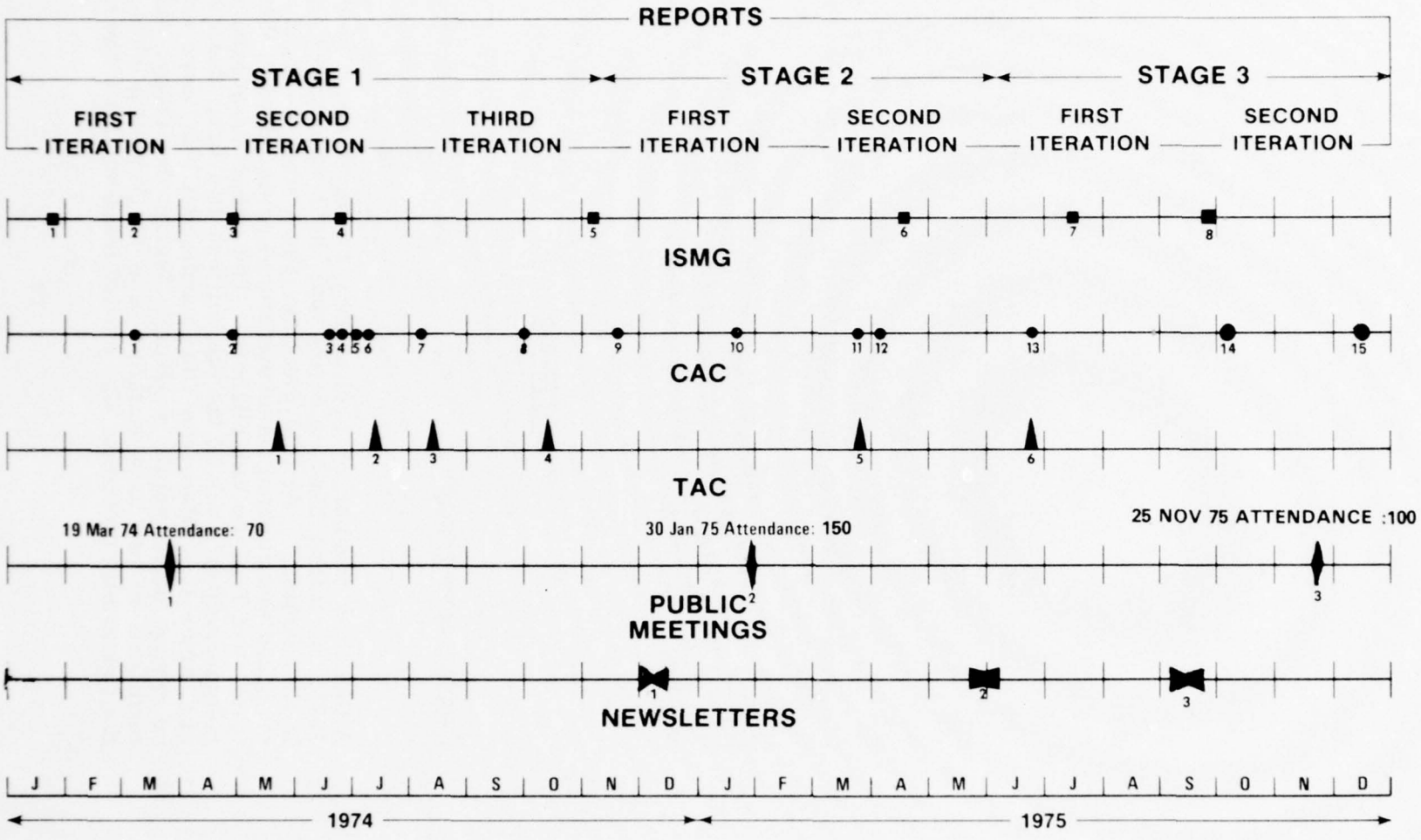
STAGE I

INITIAL MEETINGS

Although a number of preliminary meetings were held in 1973, the initial ISMG meeting was held 22 January 1974 in Binghamton. At this meeting, the Corps of Engineers proposed that a management structure consisting of an ISMG, CAC, and TAC be established. The purpose, scope, and membership of each of the committees has been described in Chapter II. Also, the Corps indicated that there would be two or three public meetings during the Study. ISMG members agreed to a tentative date of 19 March 1974 for the first public meeting. The second ISMG meeting was held

Figure IV-I

Chronology of Public Involvement Program



to solicit information on water quality problems in the Bicounty Area. The communities that were thought to have water quality problems were named. Infiltration into the sewer system was mentioned as a serious problem.

The initial CAC meeting was held on 5 March 1974 when Mr. Roland Austin, Broome County Health Department, was appointed temporary chairman. Members of the CAC were reluctant to propose goals and objectives at this initial organizational meeting and preferred to wait until the first public meeting scheduled for 19 March 1974.

PUBLIC MEETING

The first public meeting was held 19 March 1974 in Binghamton. The purpose of the meeting was to identify wastewater problems, propose Study objectives, outline study methodology, and discuss Study management.

In preparation for the meeting, an announcement was mailed to about 1,500 organizations and individuals including elected officials; Federal, State, and local agencies; libraries; the media; environmental groups; and various other associations. The announcement briefly discussed Study authority, objectives, and scope; identified Study coordination procedure; and indicated the Study schedule.

The District Engineer for the Baltimore District conducted the meeting attended by about 70 people. The District Engineer indicated the authority under which the Study was being performed, discussed some of the problems that were identified during the preliminary stage, proposed a Study methodology, and outlined a management mechanism. Methods for public involvement were also discussed. The District Engineer also presented a short discussion of the three levels of wastewater treatment (primary, secondary, and advanced) and the processes for achieving these levels.

At the completion of the presentation, the audience was invited to express their views on the Study. Problems identified were the capacity of the Binghamton-Johnson City sewage treatment plant and the bacterial count in certain sections of the Susquehanna River discouraging swimming and water skiing. The effect of wastewater treatment

practices in Susquehanna, Pennsylvania on the water quality downstream at Binghamton, New York was discussed. One of the speakers suggested that the CAC be more representative of the community at large.

SECOND ITERATION REPORT

A document entitled Preliminary Formulation of Planning Strategies, prepared by the Consultant, was distributed and discussed at the ISMG and CAC meetings on 30 April 1974. This report represented the second iteration of Stage I in the planning process as shown in Figure IV-2. The report identified existing conditions with respect to water quality including treatment levels at sewage treatment plants and identification of industrial discharges. Wastewater Management Areas were proposed and population levels were projected for these areas. Federal, state, and local planning objectives were discussed together with wastewater technologies including regionalization schemes, treatment levels, and flow reduction measures.

At the third ISMG meeting, a number of decisions were made with regard to the conduct of the Study. The Urban Study Area would be the focus of the effort but some work would be done for the Outlying Communities. It was also decided that the true capacity of the Binghamton-Johnson City Sewage Treatment Plant should be determined.

The strategies developed in the Consultant's document were based on three concepts - degrees of regionalization, levels of treatment, and time-phasing of elements within a system. A decision tree was prepared to enable study participants to determine when decisions about regionalization and levels of treatment should be made.

On the evening of 30 April 1974, the second CAC meeting was held. Loring Bixler was elected chairman, Penny O'Brien, vice-chairman, and Harriet Marsi, secretary. Copies of the proposed role of the CAC were distributed and discussed. The CAC was in agreement with the proposed role and suggested workshops in a number of communities as a promising means of increasing the communities' involvement. The Consultant's report concerning the formulation of preliminary strategies was also discussed. There was some concern about the designation of Class B

Planning Process, Stage I, Second Iteration

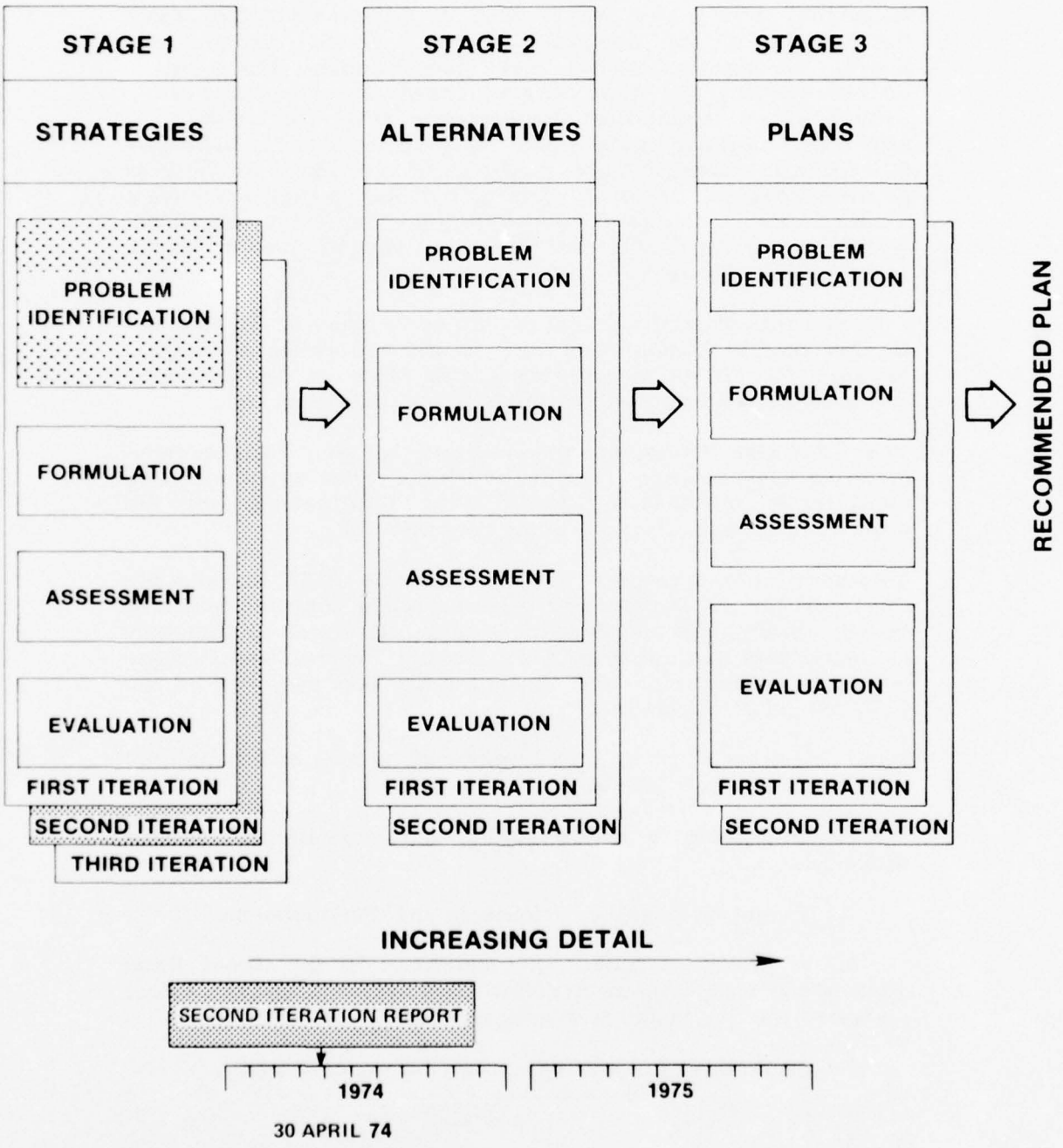


Figure IV-2

and C levels for water quality in the Susquehanna and Chenango Rivers.

The first meeting of the TAC was held 22 May 1974 in Tappan, New York and focused on preliminary problem identification. The major wastewater problems identified were the capacity of the sewage treatment plants, stormwater overflows, septic systems, and sludge disposal. The location of interceptors and new sewage treatment plants and their influence on expanding development was discussed. A stormwater management model was to be used in the study to estimate quantities and qualities of overflows at various points within the sewer system and at the sewage treatment plants. The Consultant also indicated that a stream model would be used to predict the dissolved oxygen concentrations in receiving streams.

Concern was expressed that the Study seemed to be concentrating on the Binghamton area to the exclusion of outlying areas. Problems in outlying areas were to be identified and alternative solutions to these problems proposed.

The TAC also discussed the capacity of the Binghamton-Johnson City Sewage Treatment Plant. The capacity to be established by analysis would have implications for the amount of stormwater the plant could handle.

Two additional meetings were held by the CAC to consider the Consultant's report and discuss other matters relative to the Study. Mr. Donald Wager, Broome Community College, was elected to replace Loring Bixler, who resigned. It was also suggested that at least one member of the CAC attend all ISMG meetings.

The CAC decided to bring a number of issues and problems to the attention of the ISMG:

1. Magnitude of water quality problems in the Tioughnioga River.

2. Extent of algal problems in the Susquehanna River.

3. Wastewater treatment practices in the Great Bend area of the Susquehanna River in Pennsylvania and the effect on water quality in the Bicounty Area.

4. Impact of agricultural runoff on water quality.

5. Impact of wastewater management practices on groundwater.

6. Completeness of the list of industrial discharges.

Another topic of discussion was the wastewater management problem in the Chenango Valley area of Broome County. It was reported that the Broome County legislature had hired a consultant, Mr. R. J. Martin, to study whether a sewage treatment plant in the Valley or an interceptor to the Binghamton-Johnson City plant would be most cost-effective.

THIRD ITERATION REPORT WITH ADDENDUM

A second document entitled, Evaluation of Preliminary Planning Strategies, 25 June 1974, prepared by the Consultant, revised the regionalization strategies. Various treatment levels were considered together with an examination of flow reduction devices. The Addendum refined material presented in the main report and made a graphical comparison of strategies. There was, in addition, a brief description of impacts included for each strategy. Land application of 15 mgd of secondary effluent during the months of July, August, and September was considered. There was also a discussion of various stormwater management strategies.

The relation of the Stage I, Third Iteration Report to planning process is shown in Figure IV-3. The remaining meetings of Stage I primarily focused on the Consultant's report and the strategies that were being developed.

The fourth ISMG meeting was held in Binghamton, New York. The Consultant indicated that a preliminary analysis of environmental impacts of strategies would be available within one month. It was suggested that the Consultant develop strategies varying the level of treatment at each plant to ensure cost-effective solutions to water quality problems. It was decided that wastewater management in Outlying Communities would be studied in less detail than for the Urban Study Area. The work for the Outlying Communities would include population projections, existing wastewater management practices, generalized strategies that could be applied to any community, and cost estimates for treatment

Planning Process, Stage I, Third Iteration

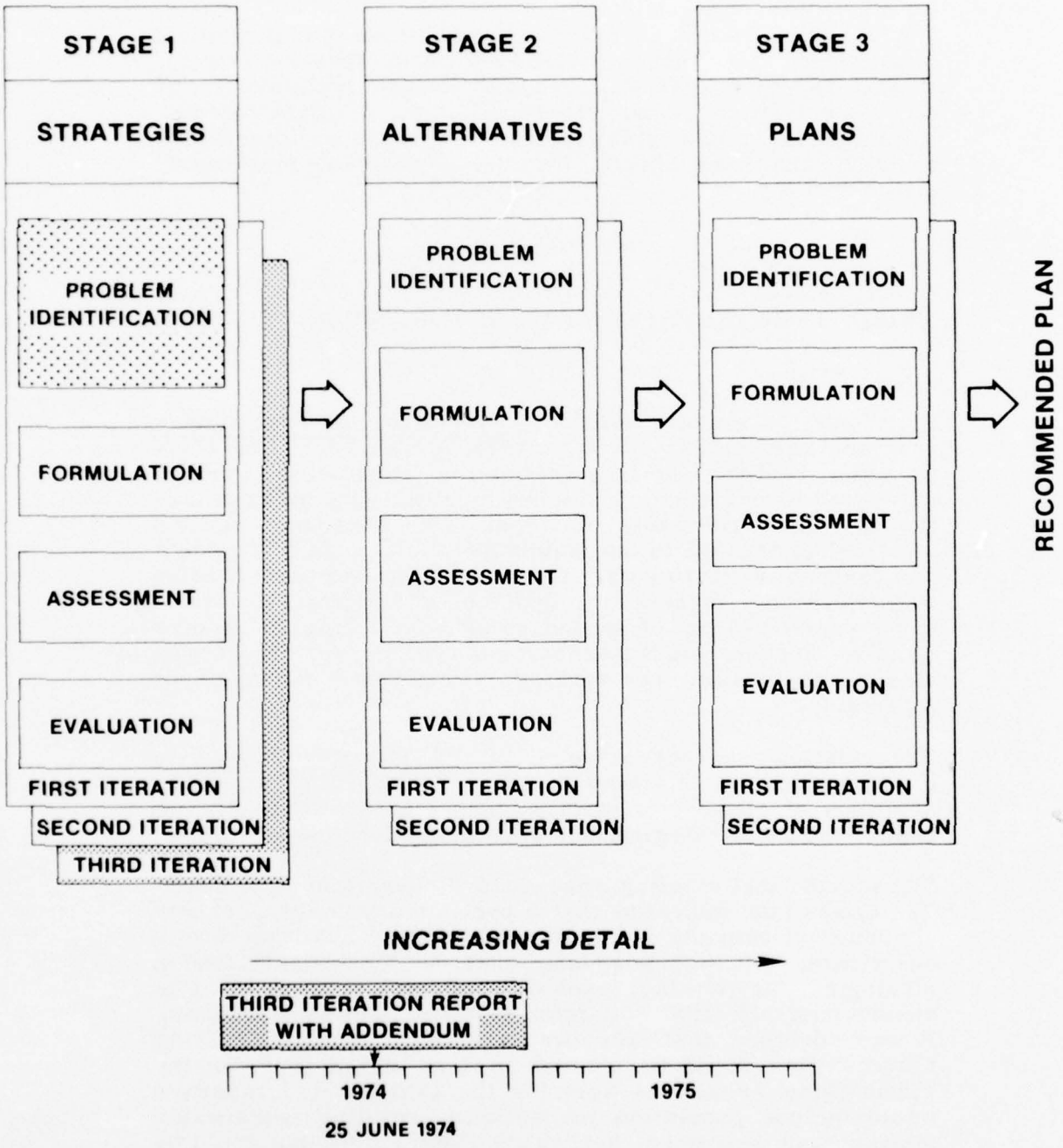


Figure IV-3

systems of differing capacities. Further definition of the level of detail for outlying areas would be a topic for discussion at the next TAC meeting.

As a result of the meeting, the ISMG agreed that the most significant water quality problems in the Bicounty Area were: capacity and associated nitrogenous oxygen demand (NOD) removal at the Binghamton-Johnson City sewage treatment plant, reduction in dissolved oxygen concentrations downstream from the major treatment plants, combined sewer overflows during storms, sludge disposal, and provision for future wastewater flows.

Three CAC meetings were held toward the close of Stage I. The Committee offered a number of suggestions for study direction. Wastewater treatment should be sufficient to provide for primary contact recreation in all reaches of the Susquehanna and Chenango Rivers in the Bicounty Area. There was some opposition to advanced waste treatment because of excessive costs and only minor benefits to be obtained. However, it might be possible to use advanced waste treatment methods only during critical low flow periods during the summer. The level of treatment need not be the same at each plant. Non-structural measures should not be investigated as separate strategies, but rather should be considered as additions to other strategies. The CAC also questioned whether complete regionalization (one plant) would be feasible. They favored a regionalization scheme between three and six plants.

It was decided that a newsletter would be the best way to report to the public on the progress of the Study. The Corps and the CAC would write the newsletter as a joint effort and the Corps would mail it. In response to an earlier question, it was reported that Susquehanna, Pennsylvania had a secondary plant under construction. Therefore, there would be little effect on water quality in Binghamton by wastewater management practices in the Susquehanna River in Pennsylvania.

Two TAC meetings also were held in the later periods of Stage I. The meetings were held to respond to questions from the CAC and to recommend to the ISMG strategies to be carried forward into Stage II.

The TAC discussed at length the problem of infiltration of water into the sewer system. The City of Binghamton had contracted an engineering firm to study infiltration. Definitive costs for controlling infiltration would not be available for a few months. Preliminary data indicated that about

4,000 feet of interceptor lines on the north side of the Susquehanna River east of the Chenango River in the City of Binghamton (Court Street Interceptor) had major infiltration problems. There were also suspected infiltration problems on the south side of the river. Preliminary data indicated that during dry conditions, infiltration was about 4 mgd. With high groundwater levels, and high river stages, infiltration could be as great as 25 mgd. A complete analysis of infiltration control would have to await completion of the study by the City.

In response to a question about expansion of sewage treatment plants, it was reported that all sewage treatment plants had enough land for expansion to provide advanced waste treatment facilities. There could be a problem at the Binghamton-Johnson City plant, however, if there were complete regionalization with wastewater being received from the entire Urban Study Area.

Preliminary sites for land application of wastewater had been located. These sites would treat 17 mgd, out of the total estimated wastewater flow in the year 2020 of 43 mgd. There would be no extensive relocation problems at these sites. Secondary effluent of 1.7 inches per week based on allowable nitrogen loadings would be applied to the soils. It was requested that an alternative be investigated using land treatment only during the summer months. Large holding lagoons, then, would not be required.

In response to a request by the CAC, the Consultant would analyze the feasibility of providing different levels of treatment at various sewage treatment plants in order not to provide more treatment than necessary to meet stream standards.

Three strategies were proposed to control stormwater: storage at overflow points with release to combined sewers during extended periods of time after peak flows, treatment at overflow points and release to natural waters, or transportation of all stormwater overflows to a central treatment site. Additionally, all three of these alternatives could handle excess infiltration flow during periods of wet weather.

The TAC agreed to recommend to the ISMG 3, 4, 5, and 6 plant regionalization schemes. These four schemes all had similar costs and provided similar DO concentrations. Impacts would be different, however. Higher degrees of regionalization (i.e., fewer numbers of STP's) would mean more interceptors and greater institutional constraints in implementing alternatives.

STAGE II

As the study progressed and committees became organized, a review procedure was established (as shown in Figure IV-4). After a report was issued, the CAC and TAC would meet one or more times to discuss and analyze the work. Recommendations for Study direction were made by both committees. When a conflict arose or when critical issues needed to be resolved, an ISMG meeting was held. The ISMG usually reached a concensus about the issues and directed the study team to continue its work.

FIRST ITERATION REPORT

An extensive two volume report was submitted by the Consultant on 11 September 1974 summarizing the topography, climate, geology, and soils of the Bicounty Area as well as general solutions to water quality problems in the Bicounty Area. Historic and projected population and economic patterns were described. A general profile of the environment was presented. Existing wastewater management practices were discussed and flow rates projected using population and economic data. There were separate chapters on stormwater, sludge disposal, and wastewater management in outlying areas. Preliminary solutions, as identified in earlier reports, were presented and impacts assessed. Alternatives were recommended for investigation in the next iteration. Figure IV-5 shows the relation of the report to the planning process.

A number of study management meetings and a public meeting were held primarily to discuss the alternatives recommended in the Stage II, First Iteration Report. Newsletter No. 1 informed the general public of study progress.

Three CAC meetings were held early in Stage II to discuss the First Iteration Report, review the newsletter, and prepare for the second public meeting. The CAC questioned whether the DO in the river near the Binghamton-Johnson City STP could be raised by discharging effluent at different points in the channel. The Consultant replied that the most significant impact of this effluent was several miles downstream so that changing the discharge points would have

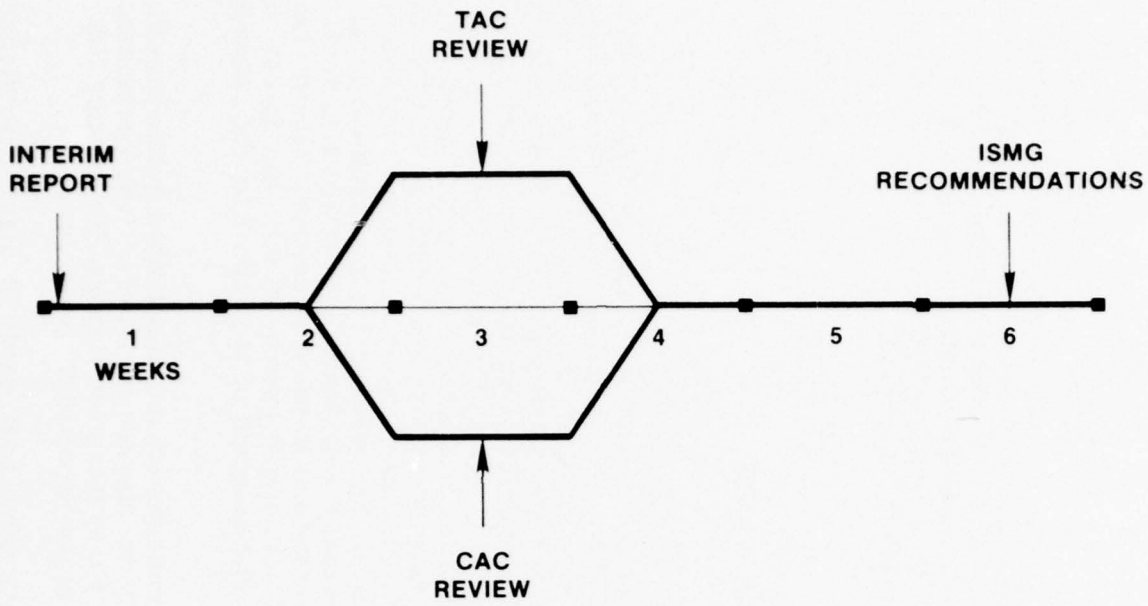


Figure IV-4
Sequence of Study Review

Planning Process, Stage II, First Iteration

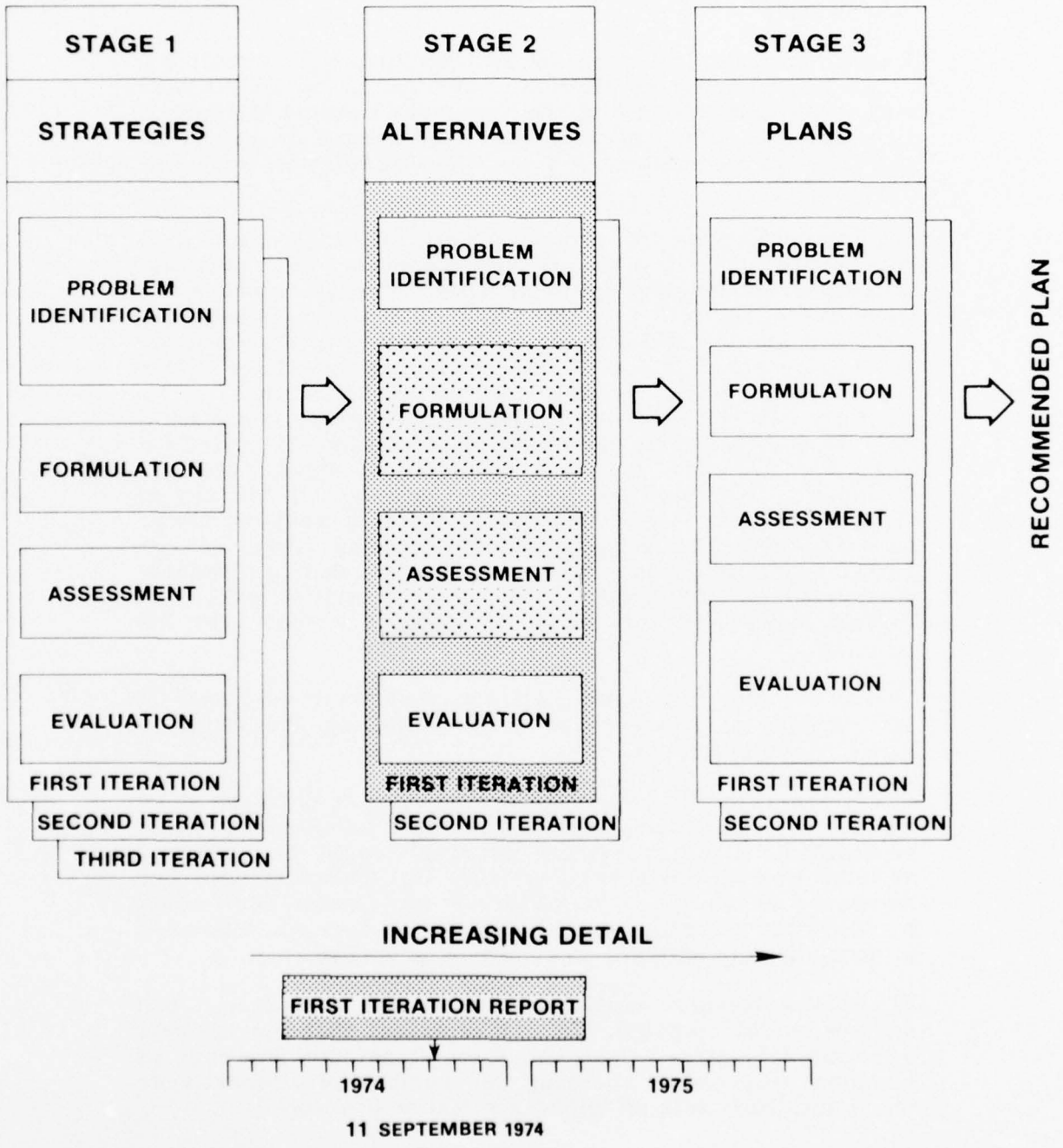


Figure IV-5

negligible effect. The population and economic projections were also questioned. The Consultant stated that many projections were examined and one chosen that appeared most reasonable and most consistent with STERPB projections.

A subcommittee had been formed previously to assist the Corps in preparing newsletters. A draft of the first newsletter was distributed and the Chairman requested changes or additions. The subcommittee then prepared comments and early in December 1974 the first newsletter was published.

A primary purpose for two of the CAC meetings was to discuss publicity for the second public meeting. The publicity subcommittee reported their activities. Press releases had been distributed to the media. Spot announcements had been recorded and the tapes would be distributed to the stations. The Chairman of the CAC had been interviewed for three television programs varying from 5 to 15 minutes. The publicity subcommittee also recorded two newspots for local television to publicize the meeting. Additionally, the CAC had also prepared a quest editorial to appear Sunday, 26 January 1975 in the Binghamton Press. On the day of the meeting, starting at 10:00 a.m., movies would be shown on wastewater management. At the meeting, maps of regionalization schemes and diagrams of treatment technologies would be displayed. Also, an information packet on various aspects of the Study would be distributed at the meeting.

The fourth meeting of the TAC was held early in Stage II. The purpose of this meeting was to discuss the Stage II, First Iteration Report.

It was suggested that the methodology of cost calculation be explained. The Consultant agreed that terminology would be defined and a cost-flow diagram would be prepared showing how all costs were derived. Infiltration control was discussed as well as stormwater management. Both could be developed as individual components so they could be used interchangeably with any alternatives proposed.

There was disagreement about the social, economic, and environmental impacts. It was explained that the impacts were the subjective judgement of the Consultant and that as planning progressed reducing the number of alternatives, more definitive data on impacts would be developed.

The alternatives to be carried forward were discussed also. It was agreed that the Baseline Condition Alternative would be carried forward as a basis for comparison among other alternatives. It was suggested that advanced waste treatment be added to each regionalization scheme even though, at the time, advanced waste treatment was only shown with the four plant regionalization.

Restricting sewer service areas was a component of one of the alternatives. Some of the members of the TAC questioned the effectiveness of this measure. They felt that growth would not be limited by imposing water and sewer restrictions since sub-surface systems would be used instead. There could also be legal action if sewer service restrictions were imposed. Therefore, the TAC agreed that sewer service restrictions should be eliminated from the non-structural alternatives and concepts such as land use controls be included. The TAC agreed on the alternatives to be recommended to the ISMG for consideration in the next iteration.

The fifth ISMG meeting was held to reach a mutual concensus on those alternatives to be carried forward into the next iteration. The alternatives recommended by the CAC and TAC for further consideration were presented. It was generally accepted to carry some alternatives with a 4 to 5 mg/l dissolved oxygen concentration unless the 5 mg/l level was established as the official standard. After much discussion, the ISMG agreed to carry 12 alternatives plus the Baseline Condition Alternative. These included the 10 originally proposed by the TAC with an additional alternative proposed by the CAC and one proposed by EPA.

PUBLIC MEETING

The second public meeting was held 30 January 1975 in Binghamton. One month prior to the meeting, an announcement was sent to about 1,500 interested agencies, organizations, and individuals. The announcement identified the 13 alternatives considered for wastewater management in the Bicounty Area. Each alternative was briefly described with preliminary impacts and costs presented. A summary table was also included so the reader could easily compare alternatives.

As described previously the meeting was publicized through radio and TV announcements, panel discussions, and in newspaper articles. A sample of newspaper coverage is contained in Figure IV-6.

Previous to the evening meeting, two movies were shown continuously throughout the day. The First Pollution portrayed a broad range of sewage treatment processes, and Wastewater Bonanza stressed land application of wastewater. About 25 people viewed the films. There were a number of displays at the meeting portraying various wastewater management processes. Eight handouts were made available and are discussed in Chapter V.

The public meeting was opened at 7:30 p.m. by Colonel Robert S. McGarry, the Baltimore District Engineer, Corps of Engineers. About 150 people were in attendance. Colonel McGarry indicated that the purpose of the meeting was to present the 13 alternatives recommended by the ISMG for further refinement and to obtain suggestions, reactions, and comments on these alternatives. Then each of the 13 alternatives was described including preliminary costs and impacts.

Colonel McGarry called upon members of the Study team to make comments. EPA indicated its support of the Study and emphasized the plan must be implementable and meet the intent of the requirements of Public Law 92-500. NYSDEC reviewed the progress being made to date by the State in controlling water pollution and emphasized the upgrading in recent years of four sewage treatment plants in the Bicounty Area. SRBC described their role on the ISMG and indicated that the Commissioners would review the alternatives for consistency with other plans being made in the Susquehanna River Basin. STERPB indicated that their role on the ISMG was to ensure that needs and desires of people in the communities of the Southern Tier would be satisfied by any recommended plan or plans. The Broome County Health Department (BCHD) endorsed the Study and mentioned that they have been supplying information and technical data.

The Chairman of the Citizens Advisory Committee identified the variety of backgrounds represented on the Committee. He explained the purpose of the Committee and extended an invitation to any one present to join the Committee or express their preferences by talking to any of the Committee members.

SAMPLE OF NEWSPAPER COVERAGE

Binghamton, N.Y., Jan. 26, 1975 THE SUNDAY PRESS II

Pure Water Goal Needs Involvement

The chairman paces, summarizing the alternatives under discussion as he walks. The discussion has gone on for three hours and will continue. The chairs in the Broome County Auditorium cause paralysis. The indirect lighting makes reading the fine print of Public Law 92-500 difficult.

Yet the 20 or so members struggle to keep from becoming glassy eyed with fatigue. They continue to take notes, ask intelligent questions, and understand the implications of the alternatives they are discussing.

The members of the Citizen Advisory Committee of the Binghamton Wastewater Management Study have sat through several such marathon meetings in order to bring citizen input to this study. We are housewives, engineers, teachers, students, retired people, scientists, professionals, and just people — like you.

PENNY O'BRIEN

This column was written by Joyce Smith, Margaret Johnstone and Penny O'Brien for the Citizen Advisory Committee of the Binghamton Wastewater Management Study.

M. JOHNSTONE

JOYCE SMITH

24 SUN BULLETIN, Binghamton, N.Y. Fri., Jan. 31, 1975

THE SUN BULLETIN — RENEE MYRAE

Col. Robert S. McGarry ...talks about wastewater plans

Broome, Tioga wastewater costs discussed

By CAROL FLAKER

Engineers, environmentalists, a forester, and an archeologist were among the citizens last night who voiced opinions on plans to clean up the Susquehanna River.

About 75 persons attended the public hearing in the second-floor auditorium of the Broome County Office Building.

Col. Robert S. McGarry, Baltimore district engineer for the U.S. Army Corps of Engineers, described 13 proposals for meeting federal regulations for wastewater treatment along the river in Broome and Tioga counties.

2-B PRESS, Binghamton, N.Y. Wed., Jan. 29, 1975

Wastewater Unit To Hold Meeting

A public meeting on wastewater management for the Binghamton area will be held at 7:30 p.m. tomorrow at the Broome County Office Building, second-floor auditorium, 200 Hawley St., Binghamton.

The meeting, sponsored by the Binghamton Management Study, will provide an opportunity for residents to comment on the study's progress as well as on the 13 proposed alternatives for wastewater management in Broome and Tioga counties.

Written statements may be handed to the presiding officer at the meeting. Oral statements will be heard, but it is suggested that all important facts and statements be submitted in writing. All statements, both oral and written, will become part of the official written record on the wastewater study.

In addition to the evening meeting, two 30-minute informational films will be shown continuously throughout the day in the auditorium, beginning late Thursday morning.

"The First Pollution" produced by Stuart Finley for the U.S. Government Environmental Protection Agency, shows pollution problems and methods of treating wastewater, including land treatment and advanced biological, chemical and physical treatment.

"Wastewater Bonanza" explains land treatment of wastewater. It was prepared by a private consultant for the U.S. Army Corps of Engineers.

The films are free to the public.

In conjunction, visual displays, poster or plaque art exhibits will detail proposed alternatives for wastewater management. A booklet describing the alternatives also will be available.

"If people are concerned about the wastewater problem, and I think they should be, they can come to join our committee and deliberations and take part," urged Joyce Smith, a member of the Citizens Advisory Committee. "We'd like as much citizen participation as possible."

The Binghamton Wastewater Management Study is a cooperative effort of the New York State Department of Environmental Conservation, the Southern Tier East Regional Planning Board, the Environmental Protection Agency — Region II, the Susquehanna River Basin Commission, and the Baltimore District of the Army Corps of Engineers.

Figure IV-6

With the close of the formal presentations, a number of citizens had questions or desired to make statements. Dr. Sulich suggested a number of different methods for managing wastewater in the Urban Study Area. The president of the New York Forest Owners suggested land conservation measures, such as residual detention, to prevent surplus water from reaching streams and rivers in the Bicounty Area. A teacher and part-time farmer indicated he favored land applications for wastewater, citing difficulty in obtaining fertilizers as one benefit for that alternative. A lawyer from Owego indicated that none of the opinions of the people in the Pumpelly Creek watershed had been incorporated into the planning process. He suggested that their views be considered.

The Committee on Archaeological Resources, Triple Cities Chapter, presented a written statement to be included in the record. The Susquehanna River Basin had been the home of prehistoric Indians for thousands of years. The Chapter was concerned with the potential for destruction of archeological resources by construction of wastewater facilities and suggested that archaeological assessments be incorporated into the planning process.

Another written statement was received from the Water Ski Federation of New York State indicating that improved wastewater management practices were long overdue. They felt that there was no excuse for poor water quality in the rivers.

A statement by Benjamin Dean, including two newspaper articles written by him, was submitted subsequent to the meeting. Mr. Dean stated that the area labeled West Owego in the public meeting announcement would more properly be labeled as North Central Owego. He was also concerned that none of the 13 alternatives provided for a Pumpelly Creek sewer main and that a number of the alternatives eliminated the Village of Owego sewage treatment plant.

The record for the public meeting closed on 28 February 1975. A document was prepared that included the announcement of the meeting, a verbatim transcript, the two written statements submitted for the record, and the list of parties notified for the meeting.

SECOND ITERATION REPORT

The two volume Stage II Second Iteration Report investigated the 13 alternatives from Stage II, and recommended eight of the alternatives to be carried forward for further analysis. The methodology for screening alternatives was presented together with the DO concentration, the capacity of the Binghamton-Johnson City plant, land application of wastewater, and cost estimating methodology. Alternatives for stormwater management and problems of non-point sources of pollution were assessed. More definitive data on existing municipal and industrial wastewater systems were developed. The methodology for developing flow projections and the selection of advanced waste treatment processes were described. More detail was presented on environmental, social, and economic impacts. The relationship of the Second Iteration Report to the planning process is shown in Figure IV-7.

Two CAC meetings and a TAC meeting were held to discuss the Second Iteration Report and the eight alternatives recommended for further study. The sixth ISMG meeting reviewed the recommendations of the CAC and TAC.

Extensive discussions of technical information relative to the alternatives took place at the CAC meetings. It was reported that dissolved oxygen estimates had been raised based on more complete and reliable information. Nitrification at the Binghamton-Johnson City plant alone could provide 5 mg/l of DO in the river; therefore, nitrification at the Endicott Plant would not be necessary and represented a substantial cost savings.

The study of infiltration into the sewer system of the City of Binghamton was nearing completion. Since infiltration control possibly could reduce costs, the CAC requested that a cost-sensitivity analysis be prepared and made available to the Committee. An extensive discussion of alternatives for managing wastewater in the Chenango Valley occupied a major portion of the CAC meetings. Mr. Martin, the consultant hired by the Broome County Legislature to examine wastewater alternatives for the Chenango Valley, presented highlights of his report. The original plan for wastewater management in the Chenango Valley was for sewage to be pumped to the Binghamton-Johnson City plant. Even at this time, there was some question as to the ability of the Binghamton-Johnson City plant to handle both the Chenango Valley wastewater flow and normal wet weather

Planning Process, Stage II, Second Iteration

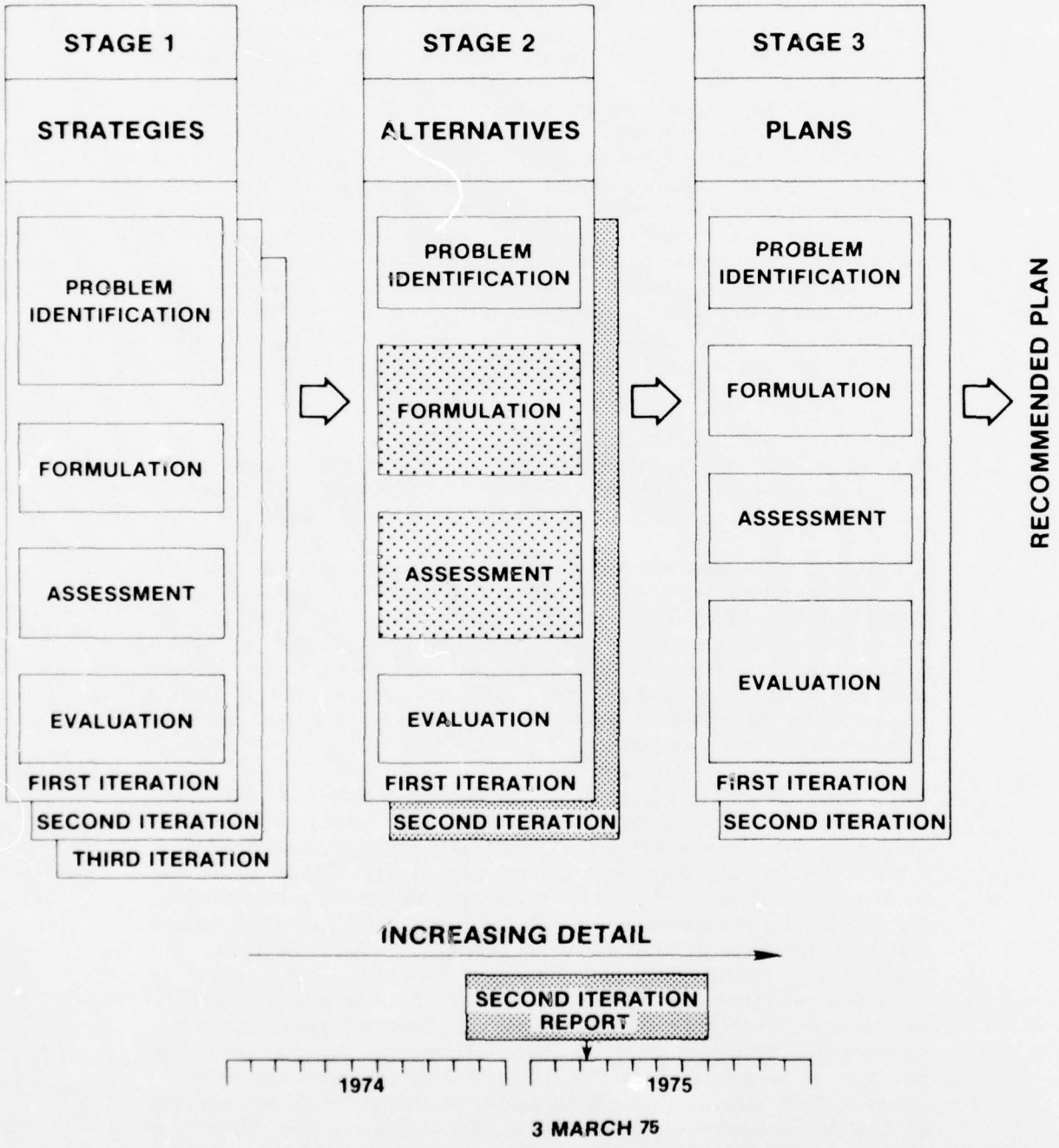


Figure IV-7

flow. Mr. Martin suggested several advantages to a new treatment plant in Chenango Valley. Not all effluent would enter the river at a single point. Thus, economies could be achieved by providing different levels of treatment at the two plants. Mr. Martin stated it would cost twice as much to pump sewage to the Binghamton-Johnson City plant as it would to build a plant in the Chenango Valley.

The CAC raised a number of questions and issues about the Chenango Valley plant. A park is located just downstream of the proposed plant and it was questioned whether swimming would be curtailed because of high coliform counts. Mr. Martin stated that the outfall could be extended downstream of the park at a cost of about $1 million. The size of the plant would be 1.2 mgd initially, and reach a maximum of 3.4 mgd. It was questioned whether the plant would be on the flood plain. Mr. Martin assured the study participants that it would be flood-proofed for protection against major floods.

There was an extensive discussion of the selection of alternatives for further study. The Baseline Condition Alternative was accepted for comparison with other plans. Regionalization schemes included 4, 5, and 6 plants. Two alternatives were eliminated because they had only one plant in Tioga County. This alternative would have resulted in interceptors crossing the river in a particularly unspoiled and attractive area. It was suggested that an alternative be considered that kept all treatment plants but added more non-structural measures. This could be considered under regionalization comparisons. The eight alternatives recommended for further study were: the Baseline Condition Alternative, two regionalization schemes combined with three treatment processes, a non-structural alternative, and an alternative based on secondary treatment at all plants.

The purpose of the fifth TAC meeting was to resolve a number of issues that had arisen since the last meeting, to discuss the Stage II, Second Iteration Report, and to concur on alternatives to be carried forward for further analysis.

In the Second Iteration Report, two methods had been proposed to achieve advanced waste treatment. Physical/chemical treatment assumed that the treatment level proceeded directly from 1977 standards for secondary treatment to the 1985 "no discharge" goal. Biological AWT assumed that the treatment level proceeded from 1977 standards to 1983 objectives to the 1985 goal.

The analysis of predicted levels of DO had been changed to reflect more realistic data and assumptions. This new work raised the predicted DO for all alternatives. The addition of nitrification at the B-JC plant while maintaining all other plants at the secondary level would be sufficient to maintain the DO level in the Susquehanna River above 5.0 mg/l.

Four strategies had been proposed for stormwater control: subsurface storage tanks, microscreening, dissolved air flotation, and interceptors to carry the stormwater to the Binghamton-Johnson City plant. The TAC discussed the merits and disadvantages of the strategies and agreed that either microscreening or dissolved air flotation would be most attractive.

The issue of whether a new sewage treatment plant should be constructed in Chenango Valley or whether wastewater should be conveyed by interceptors to the Binghamton-Johnson City plant was discussed. With control of infiltration at the Binghamton-Johnson City STP, it could be possible to treat the flow from the Chenango Valley. If a new plant was constructed in the Chenango Valley, the Chenango River could assimilate the treated wastewater flow from the plant. Decreases in DO in the Chenango River would not be significant because there would be sufficient dilution. The TAC agreed that more information was needed before a decision could be made on this issue.

Seven alternatives were recommended to the ISMG for further study: the Baseline Alternative; two regionalization schemes with nitrification - one with 4 plants and one with 6 plants; a 5-plant advanced biological system; a 5-plant physical/chemical system; a 5-plant system with non-structural measures and infiltration control at the Binghamton-Johnson City STP; and an alternative with secondary treatment at all 5 plants. The TAC felt that the seasonal land application alternative should be dropped from further consideration.

The sixth meeting of the ISMG was held 17 April 1975 in Binghamton. The purpose of the meeting was to review recommendations of the TAC and CAC and to decide a course of action for the remainder of the study.

The TAC recommended seven alternatives for further refinement. The CAC's recommendation included these alternatives and, in addition, recommended that land treatment be considered further. For combined sewer overflows, the CAC felt either microstraining or dissolved air flotation could be used unless these techniques would not meet water

quality or effluent standards. If this would be the case, then the CAC would recommend storage of stormwater at combined overflow sites, with subsequent release to the existing system.

Some of the ISMG members expressed their dissatisfaction with the presentation of the costs per family for each alternative. The Consultant agreed to modify his presentation and incorporate some of the suggestions of the members.

Although the TAC recommended that the land application alternative be dropped from further consideration, the ISMG agreed with the CAC and directed the Consultant to carry the land application alternative for further study.

Application of liquid sludge to farmland was a cause of concern to members of the CAC. The Chairman indicated that trace metals had been found after an analysis of sludge from the Binghamton-Johnson City plant. The Consultant indicated that more analysis would be performed on application rates and constituents.

The alternatives for Chenango Valley were discussed. The report being prepared for the Broome County Legislature would be available shortly. In the meantime, the Consultant had been analyzing three possibilities for wastewater treatment in the Chenango Valley: construction of a new interceptor to the Binghamton-Johnson City plant; construction of a new sewage treatment plant in Chenango Valley; or construction of a storage basin in Chenango Valley to handle the area's wastewater when stormwater overloaded the existing interceptor in the City of Binghamton. Further study and coordination would be required before wastewater alternatives could be selected for the Chenango Valley.

The previous contact with the general public was 29 December 1974 when the announcement for the second public meeting was mailed to the Bicounty Area residents. The CAC and the Corps of Engineers prepared and mailed a second newsletter late in May 1975 describing the progress of the Study through Stage II, Second Iteration.

STAGE III

FIRST ITERATION REPORT

The two volume First Iteration Report for Stage III identified in more detail the eight alternatives carried forward from Stage II. The report presented the rationale for choice of four recommended alternatives to be studied in detail as the final plans. These plans were the Baseline Plan, a 4 mg/l DO plan with a five plant regionalization scheme, a 5 mg/l DO plan with a five plant regionalization scheme, and an advanced waste treatment plan with a four plant regionalization scheme. Figure IV-8 shows the relation of the report to the planning process.

The thirteenth CAC meeting focused on the Stage III, First Iteration Report. The CAC stressed the importance of Institutional Analysis section of the report and felt that more refinement was needed. The Consultant assured the CAC that this would be accomplished.

The controversy of whether a new plant should be built in the Chenango Valley or whether wastewater should be transported by an interceptor to the Binghamton-Johnson City plant generated considerable discussion. The Consultant clarified his position that it would be just as cost-effective to construct an interceptor to the Binghamton-Johnson City plant. The CAC requested the data be expanded and clarified and sent to members for their perusal.

Since no representatives from Tioga County were present, the CAC members felt that selecting a Tioga County regionalization scheme was not appropriate. The Chairman indicated he would write to Tioga County CAC members and ask them for their opinions.

The CAC agreed with the report recommendation for dropping the land application alternative and accepting the biological AWT system to meet the "no discharge" objective of the Study. They were also in agreement about keeping a 4.0 mg/l DO plan for further study.

Non-structural measures evoked considerable discussion. The CAC requested an analysis of such flow reduction measures as the installation of water-saving toilets and showers in new homes. The Consultant agreed to provide this information.

Planning Process, Stage III, First Iteration

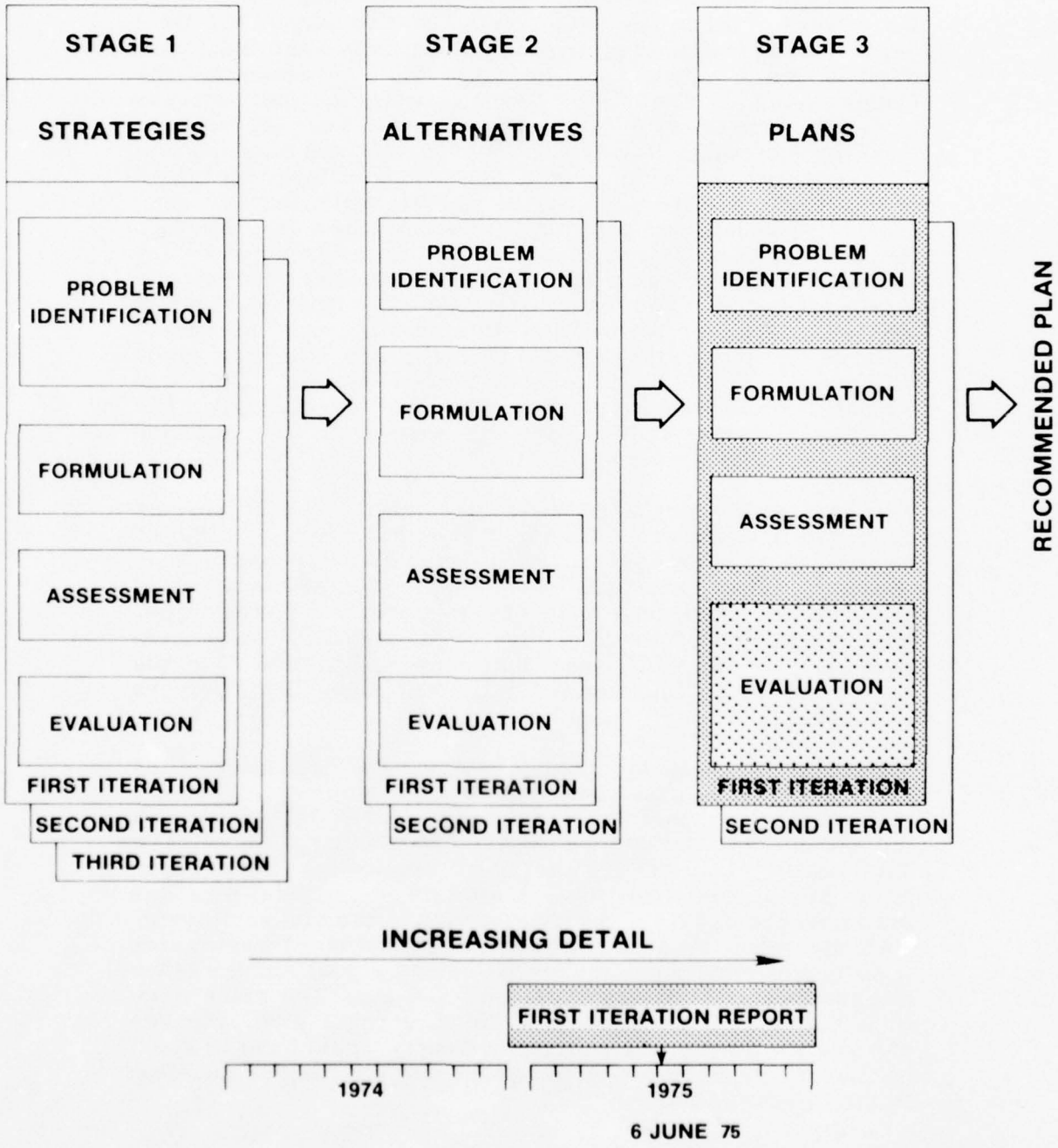


Figure IV-8

The sixth meeting of the TAC was held to consider the alternatives to be carried forward into the final iteration of the Study.

Wastewater management in the Chenango Valley was again the subject of a considerable amount of discussion. Martin's report recommended construction of a new sewage treatment plant in the Chenango Valley while the Consultant for the Corps suggested that other alternatives were equally attractive. The Consultant described the alternatives that he analyzed for Chenango Valley. The TAC then recommended that the short outfall (which would discharge effluent upstream of the Route 81 River Park) be deleted from further consideration because of potential impacts at the Park. Further discussion of wastewater management in the Chenango Valley included the suggestion that the most expedient method for handling wastes from the Chenango Valley be implemented; that is, whichever alternative (the new sewage treatment plant or the interceptor) could be constructed earlier would be better. The question was raised whether EPA and NYSDEC would fund a plan that was not cost-effective. The two agencies agreed to obtain the answer to that question by the next ISMG meeting.

Non-structural measures were described. A 27 percent decrease in wastewater flow by the year 2000 was estimated by using a pricing system and an educational program emphasizing immediate personal savings. Sludge management alternatives were examined. These included incineration, land application of liquid sludge, and landfill. The general consensus of the TAC was that land application of liquid sludge should be investigated fully with landfill considered as a backup.

The alternatives to be carried into the final iteration of the study and the reasons for their selection were the final topics of discussion. Biological advanced waste treatment was the system chosen for meeting the "no discharge" goal. The TAC again recommended that land application be dropped from further consideration. A total non-structural plan was not to be carried into the final phase of the study. Rather, TAC members felt a certain level of reduction of wastewater flow by non-structural means be set as a goal for the other alternatives. Both 4.0 mg/l and 5.0 mg/l DO plans were to be carried forward. With the 5.0 mg/l plan, the regionalization scheme for Broome County would have to await further study because of the plant vs. interceptor question in the Chenango Valley.

The seventh meeting of the ISMG was held to review the recommendations of the CAC and TAC and decide which plans were to be selected for in-depth study in the final iteration of Stage III.

Mr. Benjamin Dean, an attorney from Owego, was concerned about the Pumpelly Creek watershed. He felt that development should be encouraged in the area south of the Village of Owego and that it should not be "zoned" as an agricultural area. Mr. Dean also requested the area labeled as "West Owego" be relabeled as "North Central Owego."

Alternatives for sludge management were discussed. EPA considers funding for land application of liquid sludge on a case-by-case basis. Capital costs for trucks and holding facilities would be eligible for grants, but the actual land for application sites would not be eligible. The ISMG recommended incineration be dropped from consideration. Land application of liquid sludge would be carried as the primary sludge management alternative, and landfill as a back-up alternative.

The ISMG devoted considerable time to the Chenango Valley issue. The report prepared for the Broome County Legislature by Martin recommended that a sewage treatment plant be constructed in the Chenango Valley, while the Corps' Consultant proposed an interceptor to the Binghamton-Johnson City plant. The differences in the assumptions of the two reports were discussed.

NYSDEC reported that if a sewage treatment plant were constructed in the Chenango Valley, funding may be available only for the short outfall (pending a complete environmental analysis of both the short and long outfalls).

A number of questions needed to be resolved before the ISMG could decide on a plan for Chenango Valley. These included: when would the results of the the sewer system evaluation for the City of Binghamton be available; how long would it take to form a sewer district; how could the rate structure be made equitable for the Chenango Valley residents, and what would be the general course of action for implementation.

The TAC had suggested a first phase plant for the Chenango Valley. The plant would afford the opportunity to meet the immediate needs, to observe the results of the infiltration/inflow study, to form a new sewer district, and, if necessary, to negotiate an equitable rate structure between Binghamton-Johnson City and Chenango Valley. ISMG members felt this proposal was worthy of further investigation.

The ISMG reviewed the alternatives recommended for study by the CAC and TAC in the final iteration. The TAC recommended four plans: the Baseline Plan, 4.0 mg/l plan with 2 plants in Broome County and 3 in Tioga County, a 5.0 mg/l plan with 3 plants in Tioga County and either 2 or 3 plants for the regionalization scheme in Broome County, a biological AWT plan with 2 plants in Broome County and 2 in Tioga County. They also recommended physical/chemical AWT, land application, and non-structural measures as a separate plan be dropped from further consideration. The CAC agreed with these recommendations but were unable to arrive at a decision on the regionalization scheme for either Broome or Tioga Counties for the 5.0 mg/l plan.

The ISMG concurred in general with the TAC and CAC in their recommendations for alternatives to be studied in detail in the final iteration. They added variations in the secondary and nitrification plans so that the Chenango Valley regionalization issue could be addressed for either treatment level.

SECOND ITERATION REPORT

The final report prepared by the Consultant consisted of four appendices: Plan Formulation, Institutional Analysis, Impact Assessment and Evaluation, and Design and Cost. The Plan Formulation Appendix discussed the process of formulating alternatives in Stage II and refining plans in Stage III. A final chapter described in detail the four recommended plans. The Institutional Analysis Appendix considered existing Federal, State, regional, and local institutions that would be involved in implementing any wastewater management plan in the Bicounty Area and proposed institutional arrangements for each of the recommended plans.

Social, economic, and environmental impacts resulting from alternatives and plans were presented in the Impact Assessment and Evaluation Appendix. The two volume Design and Cost Appendix presented wastewater treatment systems for each of the four recommended plans including secondary, nitrification, and advanced systems, sludge management options, and stormwater and infiltration control schemes. Figure IV-9 indicates the relation of the Stage III, Second Iteration Report to the planning process.

Planning Process, Stage III, Second Iteration

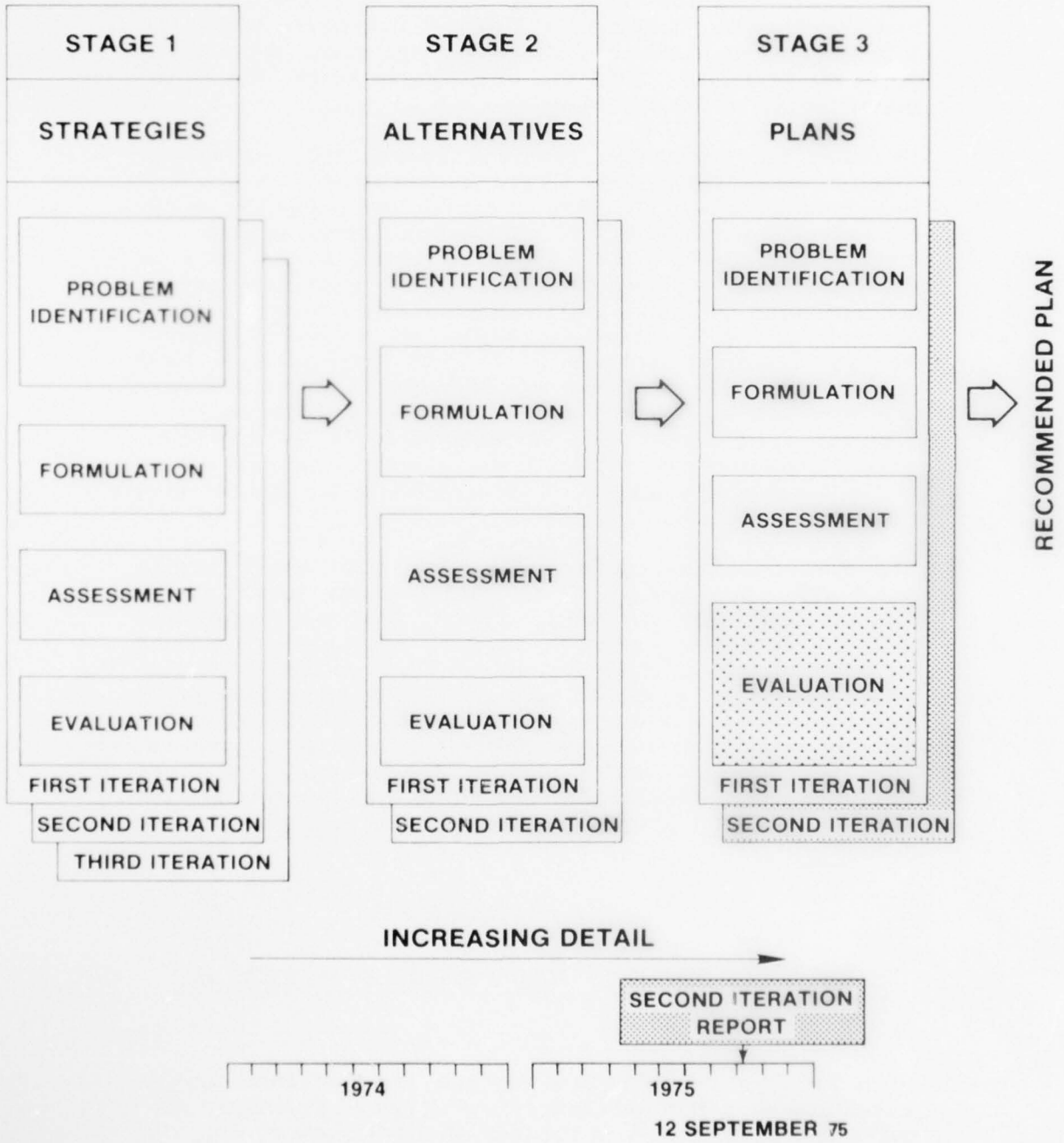


Figure IV-9

Following a review of the Stage III, Second Iteration Report, the ISMG met on 30 September 1975 to discuss the findings displayed in the Consultant's report and to arrive at a tentative recommendation for the Study. This last ISMG meeting was the culmination of long months of effort and many other committee meetings. Although numerous sequential decisions were made as the Study progressed, the purpose of the 30 September 1975 meeting was to select the "best" plan from all of the possibilities.

Considerable discussion revolved around the appropriate level of treatment for the STP's and the issue of a new STP in Chenango Valley. The Plan of Choice which was eventually recommended was a six STP plan with all plants having secondary treatment. This plan proposed a new STP in Chenango Valley and would maintain the dissolved oxygen concentration above 4.0 mg/l throughout the planning period. Microscreening of storm overflows and control of infiltration was recommended for the City of Binghamton. Land application of liquid sludge was selected as the most favorable alternative, although landfill of sludge was suggested as a backup alternative. Implementation of the technical plan could be achieved by either slight modifications of existing institutional arrangements or by expansion of the Broome County Sewer District.

The ISMG found that the recommended plan would furnish acceptable water quality in the Susquehanna River at the present time while providing a good foundation on which to build any future plans for wastewater management. When higher treatment levels are required, the recommended plan would lend itself to staged construction in either Broome or Tioga County, as outlined in the Report. Additionally, the recommended plan would lend itself to increasing levels of infiltration control and/or stormwater control. (A more complete documentation of the decision-making process for the recommended plan is provided in the Plan Formulation Appendix).

FINAL COORDINATION AND REPORT PREPARATION

As a result of the ISMG meeting and the tentative recommendation of a Plan of Choice, the Corps of Engineers prepared its draft Report in the fall of 1975 documenting the entire Study effort. The draft Report was printed in 8

volumes including: The Public Involvement Appendix, The Background Information Appendix, The Institutional Analysis Appendix, The Impact Assessment and Evaluation Appendix, The Specialty Appendix, The Design and Cost Appendix, The Plan Formulation Appendix, and The Summary Report. The draft Report was distributed to all members of the ISMG, the CAC, the TAC, the consultants, and other interested agencies at Federal, State, and local levels. Review comments were requested from each participant.

Also, during the fall of 1975, a third newsletter reviewing progress on the Study was published by the CAC and the Corps of Engineers. Institutional analysis, sludge management, regionalization of sewage treatment plants, consideration of archaeological impacts, and plan refinement methodologies were among the more important topics. The newsletter encouraged all citizens interested in water resources management to attend the final public meeting for the Binghamton Wastewater Management Study to be held in late November 1975.

In preparation for this meeting, a public announcement was sent to about 1,500 organizations and citizens outlining the topics for the meeting on 25 November 1975. A supplement to the announcement was mailed to the same people about a week later indicating that a series of informal workshops would be conducted as part of the public meeting.

Colonel Robert S. McGarry, District Engineer for the Baltimore District, Corps of Engineers, conducted the final public meeting on 25 November 1975. He briefly outlined the procedure used for the Study and described the final four Plans for Choice from which the ISMG made a single recommendation. The audience then divided into three smaller groups for informal workshop discussions. These workshops were conducted by the staff members of the Corps of Engineers who were assisted by CAC and TAC members. Questions and responses generally revolved around the technical details of the plans and the projected impacts, particularly those of the recommended plan. After the workshops, the three groups again convened as a large audience for formal statements by participants and a summary. Generally, meeting participants were in agreement with the work which had been accomplished during the Study.

Following the November public meeting, Colonel McGarry addressed a joint meeting of the Broome and Tioga County legislatures on 17 December 1975. The purpose of this meeting was to summarize the Study, explain the decision-making process, and describe the recommended Plan of

Choice. Questions and answers followed the formal presentation as the county legislators sought to gain a good understanding of the recommended plan. Most legislators reacted favorably to the Plan of Choice.

Based on written comments concerning the draft Report, the statements made at the public meeting, and the reactions of the county legislators, appropriate revisions were made to the draft Report as the final Report was prepared. For the final Report, one additional volume was prepared to accompany the 8 initial volumes mentioned in the preceding section. This extra volume, entitled Comments Appendix, contained the written reactions to the draft Report and to the recommendations of the Study. As such, the Comments Appendix contains an evaluation of the Study effort by organizations and individuals other than the Corps of Engineers.

CHAPTER V

WRITTEN MATERIAL DEVELOPED DURING THE STUDY

A number of different kinds of written material were developed for the Study. Some of these materials were distributed to the general public while others, including the Consultant's reports, were given to study participants for their detailed review. This chapter very briefly describes these materials. In Figure VI-1 is shown examples of the kinds of materials distributed to the general public.

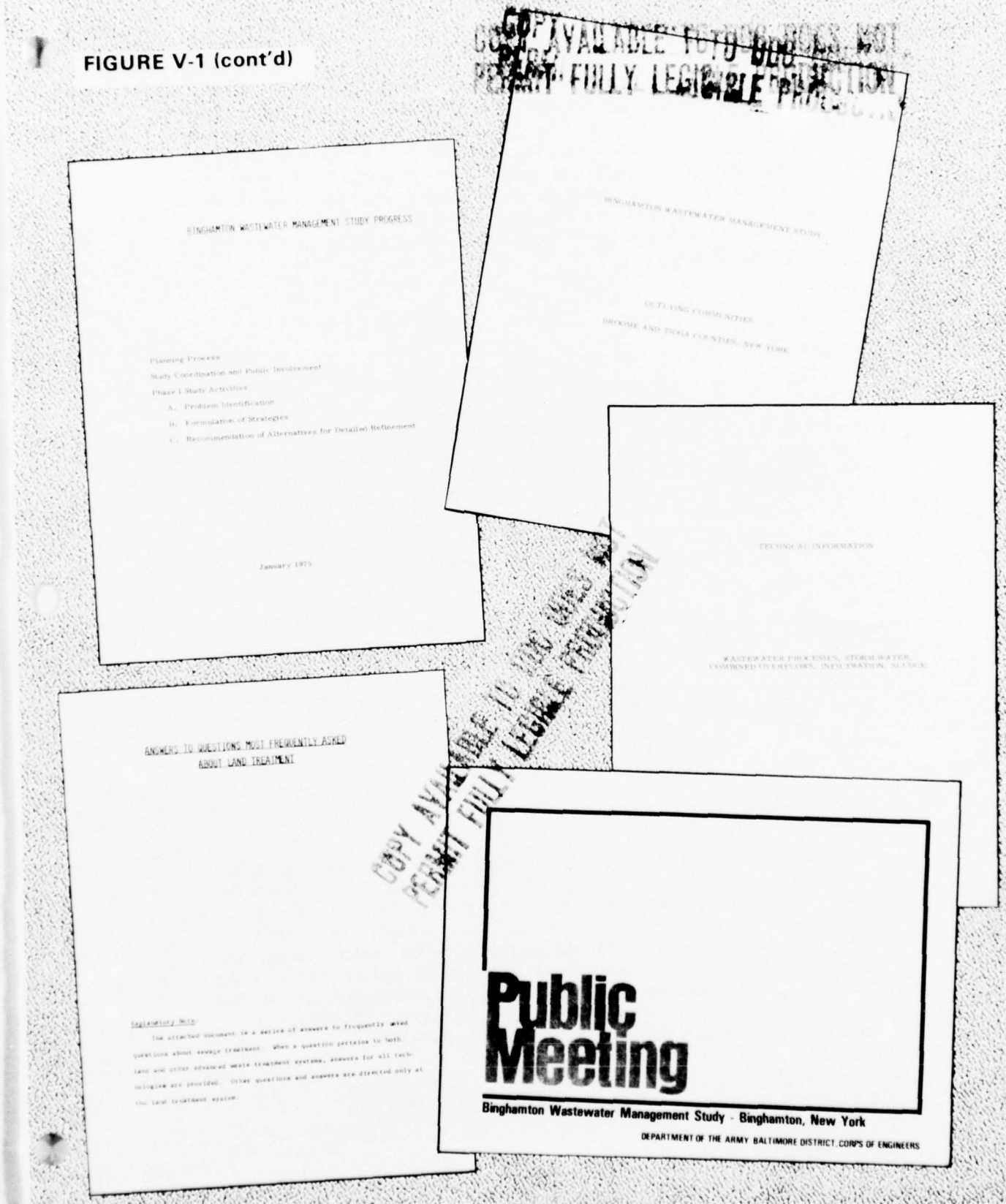
WRITTEN MATERIAL DISTRIBUTED TO THE PUBLIC

FIRST PUBLIC MEETING

The initial public meeting was held early in the Study. In preparation for this meeting, a mailing list of about 1,500 agencies, organizations, and individuals that could have an interest in the wastewater study was compiled. Congressmen, the Governor of the State of New York, and State elected officials were included as well as relevant Federal, State, county, and city agencies. The list also included newspapers and radio and television stations in the area. A national and local list of environmental interests was compiled. The final category included other interested agencies and organizations: industrial and commercial concerns, schools and colleges, civic organizations and clubs, and individuals who desired to become involved in the study. This list was used and updated throughout the Study to distribute material to the general public.

FIGURE V-1 SAMPLES OF WRITTEN MATERIALS DISTRIBUTED TO THE PUBLIC

FIGURE V-1 (cont'd)



Announcement

One month prior to the public meeting in March 1974 an announcement was sent to the general public. The announcement included the authority for the Study, proposed objectives that the Study hoped to achieve, a preliminary assessment of problems, and the scope of the Study. How the Study would be coordinated and Study procedure were also discussed. A final section indicated different phases of the two-year Study effort.

Handouts

At the public meeting, four handouts were made available. For those that did not receive the announcement of the public meeting, copies were distributed. The meeting agenda was reproduced so that the audience would have an overview of the program. The names and addresses of the preliminary Interagency Study Management Group (ISMG) members were also reproduced and distributed. This enabled the audience to identify the people who were ultimately responsible for the Study.

A primer on wastewater treatment, published by EPA in 1971, was also available. The 24 page pamphlet explained primary and secondary treatment with a short discussion of advanced treatment technologies. A glossary of terms also was included.

Transcript

A verbatim copy of the meeting was made by a stenographic reporter. During the meeting, it was announced that the record would remain open for one month for comments on the Study. Following this period, a booklet was prepared. The booklet contained the announcement of the meeting, the transcript, written statements submitted subsequent to the meeting, the mailing list, and a short description of the handouts. A form was mailed to all persons who attended the meeting indicating the booklet was available.

NEWSLETTER NO. 1

The general public was again contacted in early December 1974 when the first newsletter was prepared and mailed through the joint efforts of the CAC and the Corps. The newsletter indicated the background of the Corps' involvement in urban water resources planning, including wastewater management. The scope, reason for the Study, and the Study management structure were discussed. What the study would produce and how it would be used were also indicated. The Study schedule and participation by the public were examined. A concluding section stressed that citizen action could get results and the public should participate in the preparation, assessment, and refinement of wastewater management plans.

SECOND PUBLIC MEETING

The second public meeting was held mid-way through the Study. The Study team identified 13 alternatives that had merit for further study. The primary purpose of the meeting was to present these alternatives for public review and reaction.

Announcement

A brochure was prepared and mailed to the public in which the 13 alternatives were identified. For each alternative, there was a short description including a map. A brief discussion of the impacts was also included. Construction, operation and maintenance, and average annual costs were given. For ease of comparison, the alternatives were displayed in a table on the last page of the pamphlet.

Handouts

Nine handouts were made available to persons attending the public meeting. Public Law 92-500, the Federal Water Pollution Control Act Amendments of 1972, is the most comprehensive legislation for water quality in recent years. This Study is in partial response to that legislation. The Izaak Walton League's pamphlet (1973) entitled, A Citizen's Guide to Clean Water, served as a guide to the Act. The pamphlet identified key sections of the Act and showed how the citizen can influence water quality decisions. The pamphlet concluded with a brief description of treatment technology. A glossary described technical aspects of water quality management.

The Primer on Waste Water Treatment, published by EPA in 1971, was described previously. Newsletter No. 1 and the Announcement for this meeting were also available to participants who had not received a copy.

The five other documents included the Agenda and a pamphlet entitled *Binghamton* Wastewater Management Study Progress. The pamphlet showed the plan formulation process and included a section on study management and public coordination. There was also a discussion of the forty alternatives originally developed for the Study as well as the reasons for selection of the 13 alternatives proposed at the meeting. A pamphlet entitled, Technical Information, explained levels of treatment - primary, secondary, and advanced - and some of the different strategies being considered for advanced waste treatment. Problems of stormwater, infiltration, and sludge were also discussed.

In the back of the meeting room were a number of displays of waste treatment processes. The displays included diagrams of primary, secondary, and advanced wastewater treatment with photographs of many of the sewage treatment plants in the Bicounty Area.

How wastewater would be managed in outlying area - those outside the Urban Study Area - generated considerable discussion during Study management meetings. Therefore, a brochure was prepared identifying possible solutions to wastewater problems for small communities.

The final document distributed at the public meeting was entitled, Answers to Questions Most Frequently Asked About Land Treatment. This pamphlet discussed land application of wastewater as well as some other advanced treatment technologies.

Transcript

A booklet was prepared similar in format to the transcript for the first public meeting. The booklet contained the announcement, the verbatim transcript, material submitted subsequent to the meeting, the mailing list, and a short description of the handouts. The availability of the booklet was announced in the second newsletter.

NEWSLETTER NO. 2

Late in May, the second newsletter was mailed to residents of the Bicounty Area. The occupations and backgrounds of the CAC members and their influence on the Study process was discussed. Although Study management was briefly described in the first newsletter, the second newsletter contained more information on the agencies composing the ISMG. A section on how Federal, State, and local governments, as well as individuals, business, and industrial concerns could use the results of the Study was included. Readers of the newsletter were brought up to date on Study progress.

Methods to reduce water use and thereby reduce costs for sewage treatment were discussed. Such measures as sewer ordinances, water metering, pricing, water conservation devices, and public eduction were proposed. A final section identified how the citizen could obtain further information on the Study.

NEWSLETTER NO. 3

The third newsletter was prepared and distributed in October 1975. This newsletter stressed the fact that the Study was nearing completion and decisions would soon have to be made regarding the best plan for implementation. The text discussed the four plans available for choice as well as outlined the reasons for dropping alternatives such as land application of wastewater and advanced physical/chemical treatment. Sludge management alternatives were described as were various institutional methods of implementing the technical plans. Lastly, the newsletter encouraged Broome and Tioga County residents to attend the upcoming public meeting when formal recommendations for the study would be presented.

THIRD PUBLIC MEETING

The third public meeting was held in November 1975 near the end of the Study. The District Engineer discussed four Plans for Choice and described the ISMG's recommended plan. The purpose of the meeting was to obtain the public's reaction to the Study and the recommended plan.

Announcement

A brochure was mailed to the public announcing the meeting and identifying the primary issues to be discussed: level of treatment, number of sewage treatment plants, and methods of implementation. About a week after the Announcement was mailed, a Supplement was sent to the same people. The purpose of the Supplement was to remind the people of the importance of this last public meeting and to indicate that informal workshops would be conducted as part of the public meeting.

Handouts

Six handouts were available at the final public meeting. The Announcement and Newsletter No. 3 were given to those people who had not received copies in the mail. The Outlying Communities report and the Technical Information report, handed out at the second public meeting, were again available to interested parties. The fifth handout was a short document entitled Plans for Choice. This pamphlet briefly described each of the plans considered in the final iteration of the planning process. Included were discussions of technical data, costs, impacts, and implementation arrangements along with appropriate maps for each plan. Finally, the sixth handout was a draft copy of the Summary Report for the entire Study. It summarized the plan formulation procedure, documented the public involvement program, outlined the Study management structure, and described the recommended Plan of Choice.

Transcript

A booklet was prepared similar in format to the transcripts for the two previous public meetings. The booklet contained the announcement, the verbatim transcript, and a short description of handouts. No written statements were received prior to or subsequent to the public meeting.

REPORTS DISTRIBUTED TO STUDY PARTICIPANTS

A number of reports were prepared by both the Corps and the Consultant. These reports ranged from less than 50 pages to extensive two volume documents of hundreds of pages. Each of these reports were distributed to the ISMG, CAC, and TAC for review and comment.

STAGE I REPORTS

First Iteration Report (Plan of Study)

A draft of the Plan of Study (POS) was sent to Federal, State, and local agencies for review. The draft POS served as a foundation for interagency agreement concerning the conduct of the study. The Plan of Study identified the purpose, objectives, and scope of the study. A general description of the Bicounty Area included population, industry, transportation, and water features. A preliminary assessment of problems was described. Effort-sharing including detailed cost estimates for the Federal and non-Federal work items was identified.

Second Iteration Report (Preliminary Formulation of Planning Strategies)

The first report by the Consultant, dated 30 April 1974, was distributed to Study participants. A preliminary assessment of water quality problems included the average flow and capacity of municipal treatment plants. Industrial discharges were also identified. Wastewater management areas were indicated and preliminary population projected for these areas. Primary, secondary, and advanced wastewater treatment systems were explained. Infiltration/inflow control and flow reduction schemes were proposed. Then, the preliminary formulation of planning strategies was presented. Different levels of regionalization and treatment together with a number of non-structural strategies were proposed. Preliminary sludge management strategies and wastewater management in outlying areas were also discussed.

Third Iteration Report (Evaluation of Preliminary Strategies with Addendum)

The ISMG, TAC, and CAC review of the proposed strategies resulted in a report prepared 25 June 1974. In this report, major water quality problems were discussed. Regionalization schemes, treatment levels, and flow reduction

schemes were refined. More definitive estimates of costs were included.

An Addendum to the 25 June report was prepared to refine a number of the strategies. The land treatment strategy was modified to provide for only summer application of secondary effluent. A preliminary examination of stormwater control measures was also included.

STAGE II REPORTS

First Iteration Report

The report, dated 11 September 1974, compiled material developed for the study into a two volume document. The Study Area was defined and water quality problems and needs were identified. The topography, climate, geology, and soils of the Bicounty Area were described. An inventory of groundwater and surface water resources was included. Historic and current population trends were presented. Land use, including development plans such as the Riverbanks Improvement Program, were considered. Population projections by various agencies were compared and a final projection selected. Environmental conditions, including water quality and the general ecology of the area, were discussed. Existing water supply and wastewater management systems were described. Stormwater, wastewater management in Outlying Communities, and sludge disposal were the subject of separate chapters.

The report also presented the preliminary wastewater management alternatives for review and comment. The alternatives included different levels of treatment from secondary to advanced; flow reduction measures, including pricing; water conservation; and public education. Different levels of regionalization varying from one scheme to treat all wastewater at one plant to an alternative for six plants were considered. Preliminary costs and impacts for each of the strategies were presented in the final chapter.

Second Iteration Report

More definitive costs and impacts of the alternatives were presented in the extensive two volume report prepared by the Consultant. A total of 13 alternatives were investigated with some variations within each alternative. The main characteristic of each alternative, the performance of the alternatives with respect to water quality, and a discussion of costs with an associated construction schedule were included. For each alternative, social, economic, and environmental impacts were identified.

Various problems that required detailed study were included in Volume II. Schemes for managing the stormwater overflow problem in the City of Binghamton were assessed. The capacity of the Binghamton-Johnson City plant was analyzed as was the performance at the Endicott STP. The Binghamton-Johnson City plant capacity has implications for treating wastewater from the Chenango Valley. Since land application of wastewater has not been extensively used in the United States, there was a chapter describing this technology. Non-point source problems were also examined. Further data were presented on existing municipal and industrial treatment systems and flow projections were modified using more refined techniques. Advanced waste treatment processes were compared and costs for each alternative were described. Significant social, economic, and environmental impacts were identified in separate chapters.

From the 40 alternatives originally identified in Stage II, 8 were chosen to be carried forward into Stage III. The final chapters presented the rationale for this choice.

STAGE III REPORTS

First Iteration Report

The two volume First Iteration Report of Stage III was involved with screening and refining alternatives to identify plans recommended for final study. More extensive information for selection of alternatives for Stage III was given. Each of the 8 alternatives was described in more detail with respect to cost, regionalization schemes, and treatment

processes. Sludge and stormwater management schemes were also examined in more detail. In Stage III, the institutional analysis and impact assessment received primary emphasis. Extensive chapters in the report were devoted to these topics.

Detailed background data for the material presented in the first volume was included in Volume II. Regionalization schemes were identified for both Broome and Tioga Counties. A detailed analysis of sludge management and industrial wastewater problems was presented. There was further definition of recreational impacts. Background for the institutional analysis also was included. Costs and effectiveness of non-structural measures was the subject of the final chapter.

Chenango Valley Regionalization

Wastewater management in the Chenango Valley became a significant issue in the latter stages of the Study. Therefore, in early July 1975, the Consultant prepared a short report on alternatives for wastewater management in the Chenango Valley. Two schemes were considered for the Valley: there could be a separate sewage treatment plant in the Valley or wastewater could be conveyed to the Binghamton-Johnson City plant. The rationale for the choice of wastewater being sent to the Binghamton-Johnson City plant was presented in the document. Later, an investigation was made of the feasibility of constructing an interim plant in the Chenango Valley.

Second Iteration Report

The final report prepared by the Consultant consisted of four appendices: Plan Formulation, Institutional Analysis, Impact Assessment and Evaluation, and Design and Cost.

The Plan Formulation Appendix discussed the formulation of alternatives in Stage II and refinement of plans in Stage III. Investigations of special problems such as storm overflows and infiltration also were included. The final chapter described in detail the four recommended plans. Regionalization schemes were proposed for Broome and Tioga Counties as well as the level of treatment. Detailed social, economic environmental, and institutional impacts were presented.

The Institutional Analysis Appendix described existing Federal, State, regional, and local institutions that would be involved in implementing wastewater management plans in the Bicounty Area. Capability to perform certain functions related to wastewater management was analyzed. The structure of each organization also was discussed. Various institutional arrangements were proposed for each of the recommended plans. These were presented in the final chapter.

The Impact Assessment and Evaluation Appendix identified social, economic, and environmental impacts resulting from alternatives and plans. The methodology for impact assessment and evaluation was presented. Impacts of the alternatives of Stage II and the plans of Stage III were described. Detailed analyses of the impacts of recommended plans included effects on aquatic and terrestrial life, social, and economic impacts, and resource committments.

The two volume Design and Cost Appendix developed the criteria for wastewater treatment planning including population projections, resultant flow rates and the assumptions with respect to cost analyses. The design of wastewater treatment systems for each of the four plans was described including secondary, nitrification, and advanced wastewater treatment; sludge management; stormwater and infiltration control. Volume II reviewed the design and cost of alternatives developed in previous stages. A detailed description of the four plans was included.

DRAFT REPORT

Based on the Consultant reports prepared during the course of the Study and the comments of participants, the Corps of Engineers prepared its draft Report in the fall of 1975. As previously described, the draft Report was printed in eight volumes including the Summary Report, the Plan Formulation Appendix, the Background Information Appendix, the Specialty Appendix, the Design and Cost Appendix, the Institutional Analysis Appendix, the Impact Assessment and Evaluation Appendix, and the Public Involvement Appendix. These documents covered every aspect of the planning effort for the Binghamton Wastewater Management Study from its beginning to its completion. The Plan Formulation Appendix was the key to the entire draft Report as it documented and

explained reasons for each decision, drawing from information contained in the other appendices. As each volume of the draft Report was completed, it was forwarded to the ISMG, TAC, CAC, and other interested parties for review and comment.

FINAL REPORT

When comments were received on the draft Report, appropriate revisions were made and the final Report was published by the Corps of Engineers. The final Report consists of nine volumes, eight as listed in the preceding section and a ninth volume entitled Comments Appendix containing review statements on the draft Report. The nine-volume final Report is offered as a planning tool for the continuing assessment and evaluation of water quality and related resources. Implementation of measures investigated in this Report are the ultimate responsibility of local decision makers as they strive for reasonable solutions to areawide problems concerning future water resource commitments.

CHAPTER VI

ANALYSIS OF PUBLIC INVOLVEMENT PROGRAM

The Binghamton Wastewater Management Study public involvement program involved a number of strategies to inform, educate, and elicit feedback from the public on alternate wastewater management schemes. The process and methodology for this program have been discussed in previous chapters. This chapter assesses the public involvement program and suggests changes that could make similar programs more effective.

STUDY PARTICIPANTS

Most of the study participants felt that the volume of work to be accomplished in the time frame allotted was too great. This was particularly true of the CAC who volunteered their time. Federal and state agencies also felt that the material to be reviewed was too voluminous. This might be alleviated by preparing summaries of the Consultant's reports. The summaries would be sent to Study participants together with the full report so that if the reviewer has questions, he can refer to the report.

MANAGEMENT STRUCTURE

In Chapter II, the ISMG, CAC, and TAC management structure was explained and Figure II-1 displayed the structure. Although there were technical people on the CAC, the

TAC did not influence decisions made independently by the CAC. Each reported directly to the ISMG. Even though there was communication between the two groups, there was a greater flow of information from the CAC to the ISMG and from the TAC to the ISMG rather than directly between the TAC and the CAC.

Interagency Study Management Group

The ISMG was designed as the decision-making body for the study. The group was made up of responsible agency members who had the authority to make choices as the study progressed. Due to other commitments and obligations, some persons originally scheduled for the ISMG meetings were absent for a number of meetings. The representatives of these members attended in their place. These staff members usually were the same individuals who were at the TAC meetings so the ISMG meetings were reduced to TAC meetings.

Another problem with the ISMG meetings was that the members became involved in minute technical discussions when their purpose was to arrive at decisions. One suggestion for solving this problem was to initiate ISMG meetings later in the study process and hold the TAC meetings earlier. In the Binghamton Study, the ISMG met three times before the TAC met for the first time. It is suggested that this process be reversed in the future; a number of TAC meetings should be held after the initial ISMG meeting formalizing study coordination.

Most ISMG agencies sent at least one member to each of the meetings. Attendance at the meetings by members and others is indicated in Table VI-1.

Citizens Advisory Committee

It was felt that the establishment of a CAC was an excellent way to determine local needs and objectives, inform the public about study progress, and to elicit comments about alternatives.

TABLE VI-1

INTERAGENCY STUDY MANAGEMENT GROUP ATTENDANCE

	1974					1975		
	1 22 Jan	2 5 Mar	3 30 Apr	4 25 Jun	5 6 Nov	6 17 Apr	7 15 Jul	8 30 Sep
Southern Tier East Regional Planning Board	2	2	2	1	1	1	2	2
New York State Department of Environmental Conservation	3	2	2	2	2	1	2	3
U. S. Environmental Protection Agency	1	2	2	3	2	-	2	1
Susquehanna River Basin Commission	-	-	-	2	2	2	2	2
Corps of Engineers	3	2	3	3	6	3	3	4
Lawler, Matusky & Skelly	1	3	3	3	3	2	1	1
Broome County Planning Department	3	2	1	2	-	1	-	1
Broome County Health Department	-	1	1	1	2	1	2	1
Citizens Advisory Committee	-	-	-	2	1	1	1	1
State University of New York	-	2	1	-	-	-	-	-
Village of Endicott	-	-	1	-	-	-	-	-
City of Binghamton	-	1	-	1	1	-	1	1
Village of Owego	-	1	-	-	-	-	-	-
Individuals	-	-	-	-	-	-	1	4

Because the work of the CAC was completely voluntary, their efforts were especially commendable. Members of the CAC suggested that funds for secretarial and mailing expenses be provided. Regulations, however, made it impossible to comply with this request.

Many of the reports prepared by the Consultant were hundreds of pages. These required review and comment within a few weeks. In some cases, this was impossible and members came to the meetings without having completed their study. As mentioned previously, this could be remedied by providing summaries to accompany lengthy documents.

Table II-2 identified CAC members and their affiliation. It was not clear whether this group was representative of the public in the Bicounty Area. A resident in Owego expressed concern that his area was not represented on the CAC. Although Owego was represented by a number of people on the CAC, not all attended regularly. More effort by the Corps of Engineers and the CAC would have ensured that Owego was regularly represented.

Membership on the CAC totaled 45 in the final phases of the study. Table VI-2 indicates that attendance at the CAC meetings was seldom more than 15. Since the materials developed for the Study were sent to all CAC members, an effort to contact those members who did not attend regularly could have been made. Some of these members probably would have desired to be removed from the CAC membership rolls.

Membership in the CAC was representative of various civic organizations, businesses, government, environmental groups, the academic community, farming interests, and other groups in the Bicounty Area. The CAC was asked to disseminate information on the Study to various groups of which they were members. This, however, did not take place because of the amount of material the CAC members were asked to review and the time it took to prepare for a presentation to their group. Information flow from the CAC to various groups should begin early and be maintained throughout the Study.

Although some members of the CAC were technically oriented, the majority were not. When the discussion turned to technical matters, some CAC members felt left out. This problem could be solved in part, by preparing summaries of a less technical nature.

TABLE VI-2

CITIZENS ADVISORY COMMITTEE ATTENDANCE

	1975										1976				
	1 5 Mar	2* 30 Apr	3 18 Jun	4** 24 Jun	5 2 Jul	6 10 Jul	7 6 Aug	8 1 Oct	9 19 Nov	10 21 Jan	11 25 Mar	12 3 Apr	13 24 Jun	14 2 Oct	15 16 Dec
R. Andrus							X	X	X	X	X	X			
N. Avers	X		X		X	X	X			X					
L. Bixler		X													
M. Bodine			X		X	X	X								
R. Breed															
R. Burger								X							
J. Butler			X					X			X	X	X		
H. Christian															
D. Coates								X							
C. Costello	X				X		X	X		X	X	X	X		
L. Dieffenderfer			X					X							
I. DuBois															
D. Elliott			X					X	X	X	X				
W. Engelhard					X	X	X	X			X				
J. Franklin			X												
E. Frankowski			X				X		X				X	X	X
D. Graves			X												
J. Harrington	X														
E. Hubbard															
M. Johnston								X	X	X		X			
R. Kropp			X												
D. Leahy															
H. Lyford	X														
B. McDuffie			X		X	X	X	X	X	X	X	X			
D. Marko	X														
H. Marsi		X	X	X	X	X	X	X	X	X	X				
R. Martin			X	X	X	X	X	X	X	X		X		X	X
E. Martiny															
J. Munk															
P. O'Brien	X	X	X	X				X	X	X	X			X	X
B. Oldwine															
F. Orlando															
M. Page															
M. Peet			X												
E. Ridley															
R. Roush															
M. Savich															
R. Scudder			X												
D. Sibal									X	X	X	X	X		
J. Smith			X		X		X		X	X	X		X	X	X
J. Sperling															
D. Stuempfle			X		X	X		X		X	X			X	X
J. VanderVelde			X				X	X							
D. Wager (Chrman)			X	X	X	X	X	X	X	X	X	X	X	X	X
H. Waring							X								
J. Waring			X		X	X	X	X	X	X	X	X		X	X
A. Wicks															
R. Windsor															
R. Wittich															
Citizen Advisory Committee Attendance by Others															
R. Austin	X		X												
J. Bailen												X			
S. Bassels													X		
F. Bennett	X														
J. Bradley	X														
W. Cohen									X						
J. Crews				X	X			X	X		X				
M. Elsahratty					X	X		X			X				
S. Genega															
W. Haines	X	X		X	X	X				X	X	X	X		
D. Haith	X			X											
W. Hanson									X						
J. Hoffarth											X	X			
P. Lawler					X	X					X		X		
R. Leef													X		
J. Mayberry											X				
J. Missavage	X							X							
D. Newton	X		X												
M. O'Toole	X														
T. Quirk	X														
J. Ritz	X				X										
J. Stanyon	X														
D. Stout								X							
W. Trieschman	X	X													
V. Vemuri											X				

* A complete attendance list of CAC members was not obtained
** Officers of CAC only

The various kinds of effort-sharing activities by State and local governments were described in Chapter III. An early decision by State and local officials to commit themselves to this program was commendable.

The CAC contribution for the second and third public meetings was notable. The Committee worked with the media. Spot radio and television announcements were distributed personally. CAC members appeared on television panel shows. Articles were written and published in the major newspapers in the Bicounty Area. The CAC also helped with newspaper coverage subsequent to the meeting. During the public meeting, a number of questions were raised from the audience. Members of the CAC were especially effective in responding to these questions.

Technical Advisory Committee

The TAC was composed of members of the planning staffs of the ISMG agencies. Much of the work of deciding technical design criteria, examining treatment systems, and selecting alternatives was accomplished by the TAC. In this capacity, the TAC was especially effective. This was, in part, due to regular attendance at meetings by staff personnel. Table VI-3 indicates attendance. As mentioned previously, a number of ISMG meetings were attended by TAC personnel. This increased the workload of the TAC.

PUBLIC MEETINGS

A great deal of time and effort was devoted to the three public meetings. All three meetings were reasonably well attended, with 70 for the first, and 150 for the second, and 100 for the third. With audiences of this size, two-way communication is difficult. The public meetings opened with a presentation by the District Engineer followed by formal statements of elected officials and government agencies. Then, comments were requested from the audience. This format does not foster two-way communication. Therefore, less emphasis should be placed on the public meeting as a vehicle for public involvement and more on other techniques such as workshops and presentations to groups. In this

TABLE VI-3

TECHNICAL ADVISORY COMMITTEE ATTENDANCE

	1974				1975	
	1 22 May	2 12 Jul	3 14 Aug	4 11 Oct	5 24 Mar	6 23 Jun
City of Binghamton	-	1	1	1	1	-
Broome County Health Department	-	1	1	1	1	1
Broome County Planning Department	-	-	1	1	-	-
Southern Tier East Regional Planning Board	1	1	1	-	2	1
New York State Department of Environmental Conservation	1	1	1	1	1	1
U. S. Environmental Protection Agency	1	-	2	1	1	1
Susquehanna River Basin Commission	-	-	1	1	2	2
Corps of Engineers	1	2	6	3	2	4
Lawler, Matusky & Skelly Engineers	2	6	3	6	2	4

manner, the portion of the third public meeting when informal workshops were conducted proved to be a valuable mechanism for encouraging two-way communication.

NEWSLETTERS

Public meetings and newsletters were the methods used to communicate with the general public. The announcement and media coverage for the public meetings enabled the study team to communicate their findings to the general public during certain critical stages in the planning process. Handouts distributed at the various public meetings also proved to be useful in communicating with those individuals who attended the meeting.

PUBLIC INVOLVEMENT MECHANISMS

Table VI-4 indicates various categories of mechanisms and associated techniques of public involvement used during the Study. As is apparent from the Table, various mechanisms were used depending on the nature of the information and the audience.

TABLE VI-4

PUBLIC INVOLVEMENT MECHANISMS

Information-Education	Interaction-Dialogue	Review-Reaction
Press Releases	Workshops	Public Meeting
News Conferences	Informal Contacts	Draft Reports
Brochures	Advisory Groups	
Newsletters	Interviews	
Speeches to Organized Groups	Study Group Discussion	
Reports		
Radio-TV Programs and Sport Announcements		
Briefings		
Films		
News Articles		

CAC COMMENTS ON THE PUBLIC INVOLVEMENT PROGRAM

The following 2-page critique of the Study's public involvement program was prepared by the Citizens Advisory Committee. It is presented here as well as in the Comments Appendix so the reader may appreciate its significance in relation to the public involvement program pursued by the Corps of Engineers. The CAC comments are all well-founded and should provide guidance to any agency setting up a citizens advisory group for a complex study.

Remarks from the CAC regarding its participation in the Binghamton Wastewater Management Study

The CAC is very grateful for the opportunity to participate in the Binghamton Wastewater Management Study. From our viewpoint having a CAC in such a study is a good idea and we hope that the Corps will continue this procedure for public participation.

The Citizen's Advisory Committee did not function without difficulty. We list here some of the problems encountered in hopes that this will help future CAC to avoid them.

Membership

From a total membership list of approximately 40 we had about 20 who were "reasonably" active and of these only about 10 who were active throughout the entire duration of the study. Thus about half of the membership never participated at all. Nor did they ever contact the CAC chairman or the Corps requesting that they be removed from the committee.

The active members of the CAC decided early in the study not to remove the inactive members. This decision was based mainly on the idea that even if these people were not attending CAC meetings they were receiving all study reports and were therefore becoming informed about the study. The CAC thus reasoned that the possible good to be gained by leaving them on the CAC outweighed the advantages of asking them to resign.

From time to time during the study the CAC reconsidered its position and at the conclusion of the study reached a somewhat different conclusion. Looking back we then felt that inactive members should have been asked to make a choice of three options (a) active participation, (b) inactive but continue to receive the written reports or (c) to withdraw their names from the list.

Once an active core of members is defined they should be encouraged to identify others whom they feel would make good members. This should then allow gaining the full active membership early in the study. One problem the Binghamton CAC faced was that of having too few really active members. The voluminous reports which had to be considered after a very short period of time could have been handled better had the CAC been able to assign small committees to work on segments of the reports.

On the basis of our experience it would seem desirable to have an active membership of 20-30 persons with perhaps another 10 to 20 members who would be at least intermittantly active.

Reports

The work of the CAC consisted mainly of studying and reacting to the printed reports of the engineering consultants. Understandably the Corps had established deadlines for each phase of the study. Dates were also established for the issuance of the various reports. On the basis of such dates CAC meeting could be scheduled. Problems frequently arose however when the reports were late arriving. Rescheduling CAC meetings was very difficult because such meeting dates had to be set a reasonable length of time after the arrival of the report and had to be scheduled long enough in advance to allow CAC members to arrange their personal schedules and yet the date of arrival of the reports was not known. Frequently the CAC chairman was forced to tell CAC members that the next meeting would be held on a Tuesday night 2 weeks after the arrival of the expected report. Obviously attendance has to suffer with this type of scheduling.

One might think that the CAC could have awaited the arrival of the reports and then have scheduled a meeting allowing for a reasonable period of study. Unfortunately this was not possible since the study deadlines established by the Corps could not have been met. Thus the CAC could either do a hurried job and report its reactions at the next ISMG meeting or it could take a reasonable amount of time to study the report but miss the opportunity of reporting at the ISMG meeting. The CAC opted for the former approach.

The problem of timing leads naturally to the next matter of concern--the length or volume of the reports. Three factors contributed to a sense of frustration by the CAC--the short period available for reading the reports, the length of the reports and the small number of active members. CAC members feel that many of the reports could have been more condensed. The CAC feels that in future studies of this type that summaries could be prepared either by the Corps or by the consultants. Such a procedure should take care to summarize no only the major points in each report, but also the minor ones (perhaps a standard outline form could be used instead of a Table of Contents), since the nuances of given alternative are often not immediately apparent in a summary. In addition, at least two copies of the full report should be entrusted to the Chairman for the use of individual committee members. CAC members finding something in the summary which they questioned could then proceed to the full report. The complete reports must of course be available to all members but summaries would greatly increase the CAC's effectiveness.

Some CAC members feel that the poor timing and the length of the reports was the cause of poor attendance at some CAC meetings. Some could not attend because of the short notice. Others did not attend because they had not had time to read the reports.

The CAC understands the necessity of deadlines and the unpredictability of delays but the fact remains that the time squeeze and the volume of material seriously eroded the CAC's ability to perform its designated function.

Cooperation by Corps and Consultants

Members of the CAC felt that the cooperation by the representative of the Corps and LMS was excellent. They were always very well informed on all aspects of the study and showed no reluctance in answering the many questions posed by CAC members. Neither Corps nor consultant's representatives made any attempt to influence or direct the decisions of the CAC.

The CAC is aware of the expense involved in having these representatives in attendance at the frequent CAC meetings but we feel that this attendance is essential to the activities of the CAC. In short the CAC feels that the representative of both the Corps and the consultants did an outstanding job.

Other

Some members of the CAC were engineers or people professionally acquanted with at least some of the technical terms. Others however had little or no previous knowledge of sewage treatment processes or terminology. The CAC suggests that future CACs would benefit from a glossary of such terms as MA, CD, DO, BOD, I&I etc.

In summary the CAC feels that its involvement in the Binghamton Wastewater Management Study was a worthwhile endeavor. We feel that the Study benefited from our participation. We hope that our participation will facilitate the implementation of the Study recommendations by our fellow citizens of the area.

DBW/mi
2/13/76

CHAPTER VII

EVALUATING A METHODOLOGY FOR EFFECTIVE PUBLIC PARTICIPATION

INTRODUCTION

By its very nature, planning deals with subjective or judgemental values, and the treatment of individual preferences should enter explicitly into the planning process. Although the presence of judgement is usually recognized in planning for water resources development, its treatment is ordinarily considered in the plan formulation process in a somewhat emotional manner. Consequently, an effort was made during the course of the Study to identify personal preferences and bring them into the forefront for complete decision-making. It is the purpose of this chapter to discuss a procedure which has been suggested as one approach to the decision-making task.

BACKGROUND

When a county legislator evaluates a proposed county budget, when a citizens votes on a proposed sewer bond issue, when a water resources planner projects future needs of a

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This chapter is not to be construed as necessarily representing the views of the Federal Government or of the Corps of Engineers, U. S. Army. It was the sole endeavor of Mr. James E. Crews, Chief, Urban Studies Branch, Planning Division, Baltimore District, in cooperation with the Citizens Advisory Committee.

region, important judgements are being made. In exercising these types of judgements, each person must use a number of items of information - each of which has uncertainty and is entangled in some way with the other. An underlying judgement, "policy," governs the way a person integrates the various items of information into a single position. In a very real sense, the judgemental policies of government officials and citizens shape the character of a community and influence the quality of life in that community. (Stewart and Gelbard, 1973).

Knowledge of a person's judgemental policy provides a basis for understanding why one makes certain decisions with respect to particular problems. Ordinarily, however, it is difficult to obtain such knowledge. Because such policies are frequently the result of intuitive processes, they are difficult to describe. Moreover, research has shown that subjective reports about such processes are often erroneous (Hoffman, 1960; Slovic, 1969).

Also, differences in judgement are a major source of conflict and misunderstanding. (Hammond and Brehmer, 1973). Indeed, differences in judgement can produce conflict even when people with mutual aims are engaged in a cooperative effort. Conflict occurs in these circumstances because people emphasize different means for achieving the same result. Unfortunately, conflicts arising from differences in judgement are not easily resolved because of the difficulty in discovering the implicit characteristics of a person's judgemental policy, and thus, in understanding the real reasons for the conflict. Failure to understand leads rapidly to mistrust and hostility. Analyses of judgements can exhibit and clarify the different policies that are the causes of different judgements. Showing people that conflict is the result of honest differences in judgemental policy, rather than competing self-interest, increases understanding and promotes conditions favorable to conflict resolution.

The best way to obtain an accurate description of subjective viewpoints is through an empirical analysis of actual preferences. In the jargon of the behavorial research scientist, the procedure is called "policy capturing." (Hammond, 1965) This technique, in general terms, means constructing a mathematical description of preference policy which can be used both to predict future judgements and to understand them.

This mathematical description is generally accomplished by using multivariate linear regression analyses to "capture" the relative weights a person gives to the accomplishment of various objectives. This way, mathematically calculated measures are used to reveal preferences.

APPLICATION

The members of the Citizens Advisory Committee (CAC) and members of the Corps' staff were asked to participate in this research effort mainly to test the relationship between concensus as a group versus individual judgemental preferences. The research focused on judgements about alternative ways of allocating resources among four principal categories. The four categories selected for the study were Number of Treatment Plants (1, 2, 3, 4, 5, or 6), Total Capital Costs (the dollars involved to construct, operate, and maintain each alternative), Environmental Impacts (an estimation of the beneficial and adverse impacts associated with implementing each alternative), and the Dissolved Oxygen Level produced by each alternative.

The study was further divided into two aspects: Aspect I where forty broad strategies were developed for initial consideration and Aspect II where the final alternative selection was narrowed down from eight critical choices. Each of the alternatives represented a different combination of level of wastewater treatment, degree of regionalization, and flow reduction.

Each alternative was described by a scenario: an example of one such alternative is shown in Figure VII-1.

The scenarios were selected for the study because they are concrete, easily understood by the CAC members, and important to the successful accomplishment of the Binghamton Study. The four categories were selected because they represent major areas of concern and relate to some of the important issues affecting the future of this region.

FIGURE VII-1

ALTERNATIVE SCENARIO NO. 16

Five Plant Regionalization

This proposed alternative was generated to meet the maximum wastewater flows projected to the year 2000.

This alternative includes five treatment plants at the following locations; also shown are the volume of flows to be treateed in MGD.

	2nd	2nd + Nitrification	2nd + Filtration	2nd + F+N	Advanced Waste Treatment
Binghamton Johnson City		26.2			
Endicott		10.7			
E. Owego	2.6				
W. Owego	1.3				
Owego Village	0.8				
Chenango Val.					

As a result of this level of treatment at a cost of $15,000,000, the minimum dissolved oxygen (DO) level in the river would be 5 - 6 mg/l.

Associated with this alternative, 21.5 miles of interceptor sewer lines would also need to be constructed at a cost of $7,000,000.

Therefore, the total cost of achieving this alternative would be $22,000,000, with an annual operation and maintenance cost of $640,000, with an equivalent average annual cost of $2,300,000.

The associated impacts for this alternative are:

	Adverse	Beneficial
Health		+1
Aesthetics	0	
Socio-economic		+1
Terrestrial ecology	0	
Aquatic ecology		(+3)
Water quality		+3
Nutrients		0
Fauna		+3
Flora		0
Political	0	
Short Term Construction	-1	

PROCEDURE

Each member of the CAC received two packets of information (Aspect I and Aspect II) containing instructions and the scenarios of the different plans. Each CAC member was asked to indicate his/her personal judgement about each alternative by rating it against an arbitrary preference value of 100 which was assigned to one of the alternatives for a standard of comparison only. For example, if a particular alternative seems ten times as preferred as the standard, the CAC member would give it a value of 1,000. Likewise, if another particular alternative seems half preferred as the standard, it would receive a value of 50. As indicated above, this procedure was conducted twice: once for the broad 40 strategies and again near the end of the study for the 8 plans where choice became critical.

ANALYSIS

The preferences of each CAC member were then analyzed using multivariate linear regression and correlation techniques (Hoffman, 1960, Hammond and Hursch, 1964).

ASPECT I

Figure VII-2 presents the results of the policy analysis for Aspect I of the research. Only a few of the study participants' results are presented. These represent examples of typical weight combinations produced. The column chart indicates the relative importance of each attribute category to the person making the judgement. A large weight indicates that the level of achievement for that category has a large effect on his judgements of desirability. Similarly, a small weight indicates a relative indifference to the amount of achievement of that attribute.

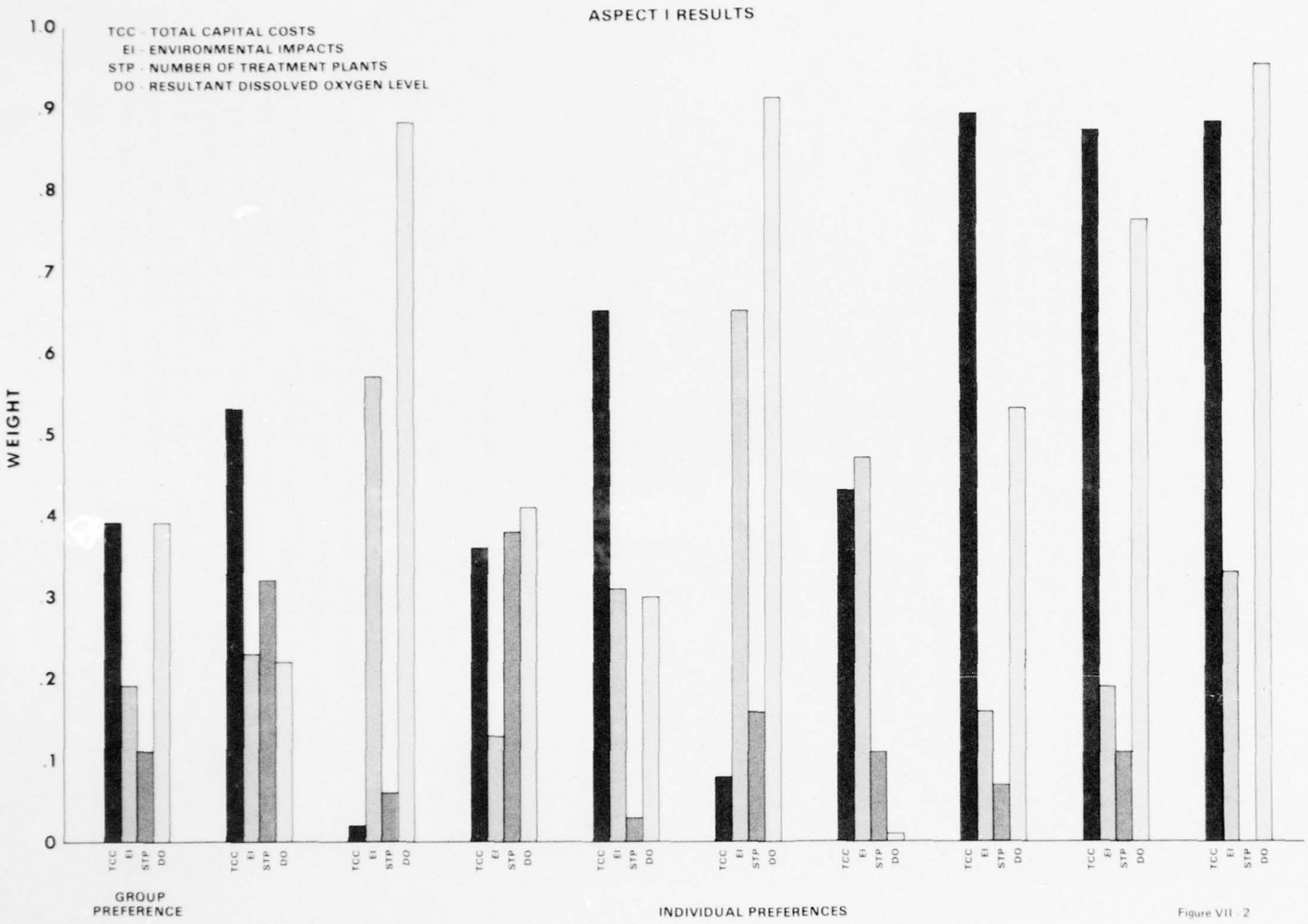
ASPECT I RESULTS
TCC - TOTAL CAPITAL COSTS
EI - ENVIRONMENTAL IMPACTS
STP - NUMBER OF TREATMENT PLANTS
DO - RESULTANT DISSOLVED OXYGEN LEVEL
WEIGHT
1.0
.9
.8
.7
.6
.5
.4
.3
.2
.1
0
TCC EI STP DO
GROUP PREFERENCE
INDIVIDUAL PREFERENCES

Figure VII - 2

The first set of weights are the combined group preferences; the remaining nine sets represent individual CAC member preferences for their judgemental policies. As can be seen from the graph, the group collectively weighted the dollars associated for each alternative and the resulting DO level produced as being equally important. The environmental impacts were then considered ahead of the number of treatment plants in each alternative. In other words, the group would be willing to trade-off dollars and resultant DO levels against minor environmental impacts such as short-term construction activities.

Examining the individual CAC member preferences produces varying opinions on the importance of different attributes. In most instances, the data results can be grouped into two categories: those that generally agreed (approximately 75 percent) with the overall concensus and those that did not. For the ones that did not, wide divergence is present. In some instances, the dollar parameter was not a critical choice; instead, more emphasis was placed on the resulting associated environmental factors. In other cases, only the more tangible parameters of dollars for construction and the number of treatment plants considered were important. Still others placed more importance on the environment and dollar attributes of consideration. Consequently, each CAC member must make trade-offs in his/her personal preferences in order to go along with the group concensus. The CAC members who ranked the environmental factors ahead of the others, especially construction costs, would have the most difficult time of accepting the group's collective decision.

How does this information then help planners and other decision makers to design the next phase of the work tasks? Obviously, more work and emphasis was needed on the project costs for each alternative as well as the environmental factors so better understandings and clearer evaluations could be made among alternative futures. The DO parameter, since it also was important in the minds of the CAC members, must still be maintained and emphasized as well. Important in the technical aspect of optimization and economies of scale, the number of treatment plants would still have to be carried and recognized in the next phase of the study, even though it did not seem as important as the other attributes of consideration to the CAC members.

ASPECT II

Figure VII-3 presents the results of the final analysis of the research. Again, only a representative sample of the preference weight combinations are shown.

The group preferences are shown in the first column with the remaining set of weights being individual CAC member preferences. As indicated by the graph, the group has now equally weighted the factors associated with the environmental impacts of each alternative and the resultant DO level achieved. Regionalization and the associated costs of the alternatives have now taken on a less important role in the decision-making process. This is to be expected as the number of alternatives has decreased thereby shifting the emphasis in evaluation procedures.

Examining the individual preferences, it can be seen that not everyone agrees with the collective opinion of the CAC. First cost still plays an important role in some of the CAC members' minds as does the number of treatment plants. Individual rankings are also widely divergent as are the varying combinations of first and second priority attributes. This again produces situations where trade-offs will have to be made if any wastewater management systems are to be finalized.

CONCLUSIONS

The purpose of this research effort was to evaluate a public participation methodology known as "policy capturing." Questions obviously exist: "What knowledge was gained by conducting the experiment that would not have been known without it?" Secondly, what are the implications for dealing with future studies and where does this type of planning fit into the overall framework?

Addressing the first question is somewhat of a problem as no control group (i.e., people who did not participate) was available for data comparisons. However, several broad statements can be made in light of the experiment. As this type of exercise is totally attitudinal, full participation must be achieved if the results are to be meaningful to decision-makers.

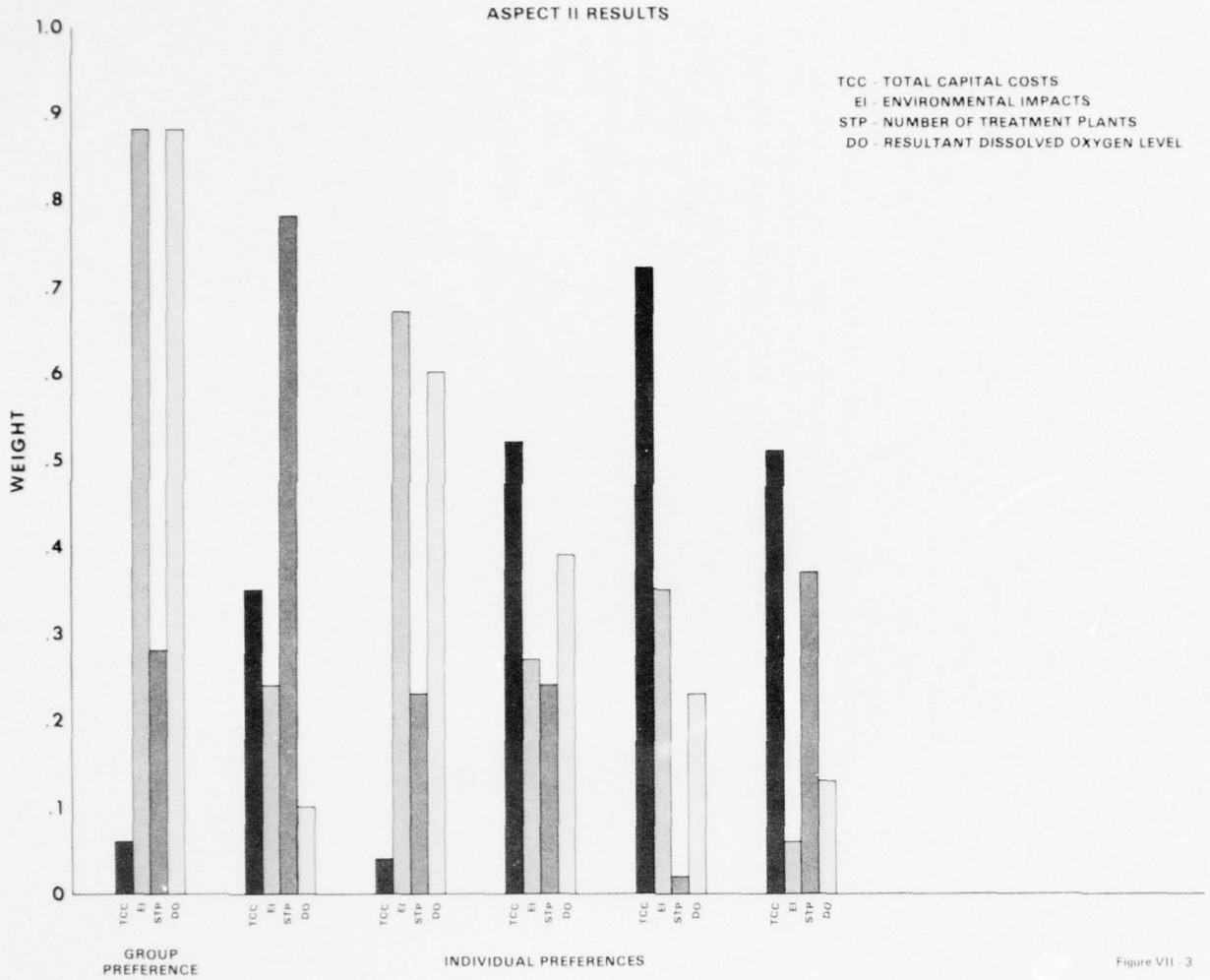
ASPECT II RESULTS
TCC - TOTAL CAPITAL COSTS
EI - ENVIRONMENTAL IMPACTS
STP - NUMBER OF TREATMENT PLANTS
DO - RESULTANT DISSOLVED OXYGEN LEVEL
WEIGHT
1.0
.9
.8
.7
.6
.5
.4
.3
.2
.1
0
TCC
EI
STP
DO
GROUP PREFERENCE
INDIVIDUAL PREFERENCES

Figure VII - 3

It can generally be said that in this case, the results of the experiment agreed with the results achieved by group concensus. However, in reaching these group concensus decisions and debates were often noticed. Not everyone always expressed an opinion whether they agreed with the group concensus or not. The preference exercise, however, did allow each individual member a chance to explicitly state their personal feelings about the alternatives.

Because of the nature of this dynamic experiment in decision-making and despite the fact that no further communication took place after the experiment, the results are still quite good and show promise for future use. With the aid of computer graphs, on site evaluations of personal preferences, and instant analysis with changes would have greatly improved the value of this experiment. This way each individual CAC member would have been able to better understand the personal preferences of the other CAC members. It could then facilitate a better understanding of the trade-offs each person must make in chosing an alternative.

The results of this study, therefore, are encouraging. They indicate that the theory and technique may be useful for public participation in water resources decision-making. If this procedure were applied on a broader scale to gauge the opinions of large numbers of people who attend meetings, it could be helpful in identifying and clarifying potential conflicts. Further research seems warranted.

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